POPULAR Computing WEEKLY

35p 8-14 September 1983 Vol 2 No 36

This Week

News Desk

Dragon crash averted by the man from Prutech

TONY Clarke, Dragon Data's managing director, resigned last Friday as shareholders succeeded in putting together a £2.5m financial rescue package to save the company.

Dragon's cash problems apparently developed as summer sales of the Dragon 32 failed to live up to expectations. The keen price cutting of home computers in recent months had not been matched by Dragon who dropped the price of its machine only £24 to £175.

The reduced sales could not have come at a worse time as Dragon urgently needed finance to gear-up production for Christmas and to complete development of a number of new products. Dragon currently has at an advanced stage of development disc drives and a punched tape add-on for the Dragon 32, a 64K machine and a new up-market business machine.

Late on Friday, September 2, Dragon issued a press statement giving the main points of the financial rescue plan mounted by Dragon's main shareholder Prutech, the venture capital arm of Prudential Assurance. Tony Clarke, chairman and managing director of Dragon has stepped down although he will retain a shareholding with the company. He has been replaced as chairman by Dr Derek Allam, the current chief executive of Prudential Assurance. The new managing director is Derek Morgan, a director of PA Management Consultants who has been "acting" managing director for three weeks. Derek Morgan's appointment is a temporary secondment and he will remain until a new managing director is chosen — expected to be from GEC. Richard Wadman remains as marketing director.

The joint shareholders have agreed to raise a further £2.5m for Dragon to help it over its short term cash problems.

Continued on page 5

Continued on page 40

★ ★ BRITAIN'S HOME COMPUTER WEEKLY ★ ★


MY NAME IS DIAMOND, DAN DIAMOND I'M A PRIVATE COP. I WORK THE BIG APPLE A SEETHING METROPOLIS FILLED WITH HUMAN MISERY AND CHINESE TAKEAWAYS
NORMALLY I ONLY DO ROUTINE DIVORCE CASES BUT WHEN SHE WALKED INTO MY OFFICE I FOUND MYSELF INOLVED IN A CASE SO STRANGE THAT IT MADE THE BIG SLEEP LOOK LIKE A CAT NAP...
HUNT WINS GRAND PRIX
At yesterday's Monaco Grand Prix a hunting party strayed onto the track at the climax of the race. Cars were halted as the hounds rampaged around the circuit. "The whole place has gone to the dogs," one driver was reported as saying. The race was restarted, riders and drivers battled bitterly around the course before the Hunt thundered past the finishing line to take the chequered flag (it hasn't been seen since)
PLAYER WINS OPEN
Eagle eyed spectators privileged
Salamander SOFTWARE
GS
PRIVATE DETECTIVE DISAPPEARS
Police are baffled by the disappearance of Dan Diamond. He was last seen approaching the eerie edifice known as Franklin's Tomb, but the authorities are completely unable to find any trace of him. Citizens are asked to report any information relating to his disappearance immediately. For further details buy FRANKLINS TOMB a new adventure game for the DRAGON 32 and 48K ORIC 1. This adventure comes complete with a 24 page illustrated Case File. £9.95 from BOOTS SPECTRUM COM
BANANA DICTATOR
2 DEAD IN EVEREST TRAGEDY
COLD WAR ON XARG ESCALA
Thousands dead in Ice Storm

8-14 September 1983 Vol 2 No 36



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12 13 Little Newport Street
London WC2R 3LD
Telephone **01-734 1051**
Published by Sunshine Publications Ltd
Typesetting origination and printing by Chesham Press Chesham Bucks
Distributed by S M Distribution
London SW9 01 274 8611 Telex 261643

ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS
ISSN 0265-0509

How to submit articles
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All submissions should be typed and a double space should be left between each line Please leave wide margins

Programs should whenever possible be computer printed

We cannot guarantee to return every submitted article or program so please keep a copy If you want to have your own program returned you must include a stamped addressed envelope

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish although we will always try our best to make sure programs work

This Week

Editorial

The £2 5m rescue package engineered by Dragon s shareholders is another indication of the volatility of the micro market

Eighteen months ago no one had heard of the Dragon 32 Nine months ago the Dragon had become one of the best selling micros in the UK with more than 50 000 units sold Now the wheel has come full circle with Dragon struggling to stay afloat in the face of increasing competition from Commodore and Sinclair

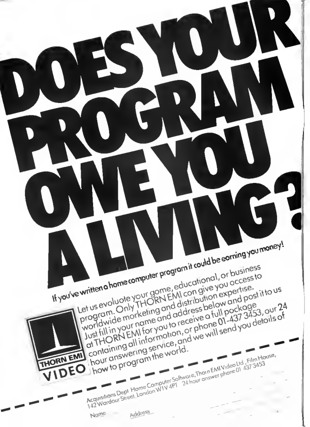
Dragon s problems have been due partly to under capitalisation but also to the rapid pace of technological change Nine months ago the Dragon with its 32K of Ram and full sized keyboard seemed like a good buy at £199 — especially in competition with the aging Vic20 and the delivery problems of the Sinclair Spectrum Now however even at £175 the Dragon is not such a bargain compared to the £125 48K Spectrum and the £199 Commodore 64

One can only feel sympathy for Tony Clarke, Dragon s former chief executive and managing director He was a popular figure within the micro industry who not only brought Dragon into being but also masterminded the company s recent link-up with Tano in the US

While Dragon s future will depend very much on the soon to be launched Dragon 64, a number of other micro companies must be looking nervously over their shoulders — Oric Jupiter Cantab and Camputers in particular

Next Thursday

Thousands of free software cassettes to be given away — for details, see next week s issue


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Digital Research puts CP/M on home micros

DIGITAL Research has announced its intention to enter the personal computer arena.

CP/M, launched by Digital in 1977, has become the dominant disc operating system for Z80-based micros — mainly in the business sector. More than 6,000 software packages are now available for the system.

Now Digital has announced a version of CP/M — Personal CP/M — for home computers regardless of processor. Also, the system can be put on Rom and is therefore capable of being used on systems which do not support a disc system.

Said Digital's director of European operations, Paul Bailey: "People are getting tired of zapping Klingons and are looking to do something more serious in life."

The way Personal CP/M works is in conjunction with another new digital product — Visual Interface Processor (VIP). VIP is a collection of around 60 simple input/output routines producing animated 'windows' on screen rather similar to the sort of thing that Apple's Lisa can do. Commands might be, for example, file handling ones such as View, Extract, Help and Quit.

These, together with a compiler for the relevant processor, mean in principle that any software written to be compatible with VIP can be run on any machine.

With Personal CP/M there is no reason why the wealth of software available under CP/M should not be translated to run on any home micro.

That at least is the hope. Digital has announced the system in the belief that micro manufacturers will see its advantages and adopt it.

Personal CP/M

At the moment it seems that only those manufacturers committed to CP/M 2.2 — the present CP/M version — are showing interest in the new Personal version.

Both Acorn and Camputers are looking at VIP and Personal CP/M. Camputers has just signed an agreement with Digital to put CP/M 2.2 operating system on to its 128K Lynx, to be shown at this year's *Personal Computer World* Show. A Camputers spokesman commented that VIP and Personal CP/M on the Lynx is likely.

It remains to be seen if other home computer manufacturers like Sinclair, Commodore and Oric show interest, particularly in the Rom version of Personal CP/M, and whether software houses who have written for CP/M convert to the new version.

Dragon rescue

Continued from page 1

The crisis has affected Mettoy — the loss-making Corgi toys maker who originally spawned Dragon just over a year ago. Following its sale of Dragon in November to the Prutech consortium, it is now unable to contribute to the rescue venture and has had to reduce its stake at the expense of the other shareholders.

The new shareholdings break down as follows: Prutech (42 percent), Welsh Development Agency (23 percent), Mettoy (15.5 percent), National Water Council (8.6 percent), F & C Enterprise Trust (4.3 percent), Fountain Development Capital Fund (4.3 percent) and Dragon executives (2.3 percent).

Apart from persistent rumours in recent months that Dragon 32 sales had slumped, the first real indications that Dragon was in serious trouble came early on Friday morning. Mettoy announced, under stockmarket rules, that its associate company Dragon Data had suffered a set back. In the period of speculation between that announcement and Dragon's notification of the rescue plan late in the afternoon, Mettoy's shares plunged from 17p to, at one point, a nominal 2p. They recovered somewhat to close at 5p.

Magical mystery tour by bus

VIRGIN Games has announced eight new games and a bus.

The new games are Death Cruise, Castle Adventure and Chine for the Dragon; Envahi and Creepers for the Vic 20 and Killer Caverns, Loops and Racing Manager for the Spectrum (the last two were previewed at the last ZX Microfair).

As for the bus — it will tour the country filled with computers and programmers just dying to tell you about Virgin Games. Tour dates will be announced soon.

NewBrain buyer?

GRUNDY Business Systems, which announced it was to go into liquidation two weeks ago, is now looking for a buyer for its NewBrain computer project.

Eight companies are reported to be interested in the NewBrain.

At meetings of both creditors and shareholders to be held today, September 8, Tim Harris of Deloittes is expected to be appointed liquidator.

Visions of the future

VISIONS is a new software house launched this week.

It will produce mostly games titles across a range of five machines — Sinclair Spectrum, Commodore Vic 20 and 64 and Acorn BBC and Electron. Two games are now available, *Sheer Panic* and *Pit Stop* [illegible] for the 16K and 48K Spectrum respectively. A version of *Snooker* will be available by the end of September across all five machines.

Rez Evitts of Visions

Sean de Bois, Visions' managing director, was previously in charge of freelance author liaison at Quicksilva before leaving three months ago to set up his own company. Joining him as directors are Rez Evitts, formerly with Quicksilva's public relations company Phoenix, John Burham, [illegible] of Visions' in-house [illegible] duplication facility, and Martin [illegible], Visions' financial director.

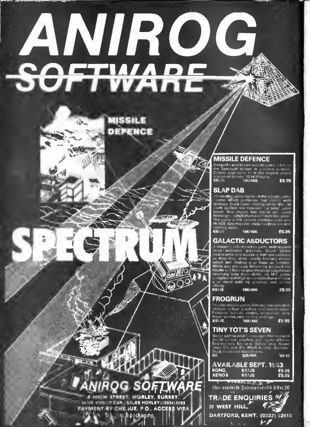
Prism, British distributor of Sinclair products and the company behind Microtel 800, has a 26 percent stake in Visions and Prism directors Bob Denton and Richard Hease are non-executive directors of Visions. Richard Hease is also chairman of ECC which publishes, among other things, *Sinclair User* magazine.

Option extended

SINCLAIR has extended its option to acquire a major portion of the assets of the former De Lorean car factory in Dunmurry, Northern Ireland.

The company is looking at the Dunmurry plant as a possible site for assembly of its proposed electric car.

The Sinclair Vehicle Project has extended its option for an undisclosed period to allow time for further separate discussions with both the joint De Lorean receivers and the Northern Ireland Industrial Development Board.


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Microdrive reply

I feel I must reply to the letter from Sinclair Research (*PCW* 18-24 August) about my Microdrive review

Regarding the use of *Tab* with printers via RS232 — it is possible to implement the command on any printer For evidence of this one has only to examine any of the Centronics-type printer interfaces for the Spectrum which all support *Tab* It is an important feature that has inexcusably been left out of the Interface Rom

I admit that handshaking is done when networking — I became confused with broadcasting over the Net which does not use it

Regrettably, protected programs will not be 'impossible' to pirate — it would be foolish for anyone to make such a claim

Bill Hoskins
London NW1

Machine code pen pal

I have also experienced the problems concerning *Jetpac* your magazine why not have a machine code helpline as well as (or preferably instead of) that stupid adventure helpline!

Think of it you could start a whole new pen pal section especially for machine coders I think a regular section just for me would also increase the number of your readers — I for one intend to buy all of your back issues with me routines/sections

If you don't think the pen pal section would go well how about putting a word in for me (as the first user) to advertise for me mates something like — Wanted (preferably alive) — machine code pen pals to swap ideas and routines with Tel 031-660 5155 and ask for Stephen Not forgetting to mention that all must be relevant to the Spectrum computer (in my case anyway) I look forward to hearing your views on my idea

Stephen Renton
Greenlees
Braehead
Lasswade
Midlothian
Scotland EH18 1HF

Stupid adventure helpline?! A lot of our adventure playing readers would disagree strongly (I hope)

However, the idea of a machine code helpline is interesting If any of our other readers would like a machine code pen pal section, please write in and let us kow.

Ultimately the best

I have also experienced the problems concerning *Jetpac* mentioned in the letter from Philip Sinn (*PCW* 25-31 August)

When all four rockets are used, the program returns to the first rocket and is liable to crash any time after that eg picking up an object losing a life or when a rocket reaches the top of the screen My high score however is 923 675 and took around 3¼ hours — it was achieved by lingering on the high-scoring sheets

I have now been informed of a method of obtaining an infinitely high score I have always noticed that points are scored when an alien crashes to the ground on the fourth sheet If you stand on the middle platform you will not be hit as it is a safe area You can even switch off the television and come back in a few hours to a very high score

PS I still think Ultimate is the best

Mark Simpson
3 Kingswear
Whitkirk
Leeds LS15 8LS

Watergate scandal

I get your magazine every week The only quibble I have is about your reviews of new games at the back

Lets have some definite recommendations tell us if the games are terrible Are you worried about offending the manufacturers or is some bribery involved? Another Watergate in the offing

Why not rate the games with factors like playability graphics addictiveness etc? In the tough world of choosing software it's difficult not to get lumbered with a mass of boring brown tape

PS Do such mysterious things as computer shows exist in Northern Ireland or are these fantastical things just confined to the London area?

PPS Are there any BBC user clubs in Northern Ireland?

PPPS Is my score at BBC *Planetoids* of 704 000 any good?

R J Platt
13 Knocktern Gardens
Belfast BT4 3LZ

To answer your questions in order another Watergate is not in the offing No bribery is involved and we are not worried about offending the manufacturers

New Releases is designed to let people know what software is coming on to the market Each new release consists of a basic description of the game or utility, together with details of price, micro, supplier, etc The object is to provide people with news, not reviews

Your points about rating the games are covered in our software reviews.

I must confess that I do not know of any shows in Northern Ireland, though a few seem to be cropping up in Eire

There is a micro user club in North Down which meets at Bangor Central Library, Hamilton Road, every fourth Monday, but it is not aimed specifically at BBC users For more information contact A Robson on 0247 67060

Finally, your *Planetoids* score seems eminently reasonable

Copying the copiers

I read with interest the piece about tape copying using *Zap* in Peek and Poke (*PCW* 18-24 August)

Zap and *Zap2* can be copied if you know where it is stored By using the header reader program it was found that *Zap* is stored in the printer buffer (ie at address 23296)

Make the header first by typing in *Save zap Code 23296 500* and Save the header only not the second part of the program Then using *Zap2* (used for copying headerless programs — which I haven't come across yet) to copy the second part of the program and Save it after the header you have just made

Zap2 can be copied in the same way but it has only 436 bytes (ie *Save Zap2 Code 23296 436*)

I hope this is of help to others who wish to copy copiers

Andrew Foster
46 Borough Park Road
Paignton
Devon TQ3 3UA

Improving on Pacman

Thank you for publishing my two efforts at programming on the Spectrum (*Pacman* Game of the Week Vol 2 No 29 and *Rem Patterns* Open Forum Vol 2 No 32) Here are a couple of improvements for my *Pacman* program which your readers might appreciate

Erase lines 2 3 and 330 Then add the following

```
2 DEF FN c() = (65000 AND PEEK
  23733    255) + (32400 and peek
  23733    128)
270 CLEAR (FN C()    1)
290 FOR I    FN C() TO FN C() + 28
350 FOR I    2 TO 5 POKE USR  S
    + I 254 NEXT I
351 POKE USR  S" + 1 124 POKE
    USR  S  + 6 124
615 IF                RANDOMIZE
    USR FN C()  RANDOMIZE USR
    FN C()
830 RANDOMIZE USR FN C()
955 PAUSE 3
```

Sam Knowles
Fennels
Lower End
Long Crendon
Bucks

Oribitor high score

In reply to Philip Crawley's letter (*PCW* 1-7 September) I also have played Silversoft's *Orbitor* and my high score was reached several months ago at 1 203 235 which took me about two and a half hours I originally wanted to see whether any spectacular display was produced at one million but the game just continued counting and since I was becoming eye-sore I decided to finish the game still with two lives left

Also I too would like to see the return of a machine code series for the ZX Spectrum — one of the main reasons I buy your magazine is that you often give useful routines to include in programmes

Mark W J Fussell
99 Chesterton Road
Cambridge CB4 5AP

Hmm There definitely seems to be a fair amount of support for a Spectrum machine code series We shall have to see what we can do



Sulis Software



An exciting new range of educational programs

Getting down to learning a tricky subject can become a good deal easier when there's an element of fun involved. And that is just what Sulis have introduced into their outstanding range of quality educational software.

In games like BESIEGED, (one of four in the SPELLBOUND series) the player learns to master the many quirks of English spelling. Correctly spelling some impossible words helps to save a beleaguered city from a horde of infidels!

WORDSPLITS available for two different age-ranges, offers hundreds of words that every child needs to recognise easily.

Not just content in getting to grips with the English language, Sulis helps tackle French verbs (regular & irregular) with TENSE FRENCH, takes a journey back in time with TIME TRAVELLER to get some historical facts right and even throws down a challenge to Shakespeare buffs with MASTERBARD.

Sulis's developing programme of software, initially cassette-based, is available for use on some of the most popular micros — in particular the BBC, Dragon, Commodore 64 and Spectrum.

Each title in the Sulis range is attractively packaged (and priced!) and can be obtained from all good bookshops and computer stores. In the meantime, for a free copy of the Sulis Software catalogue, just return the coupon.

To John Wilson, John Wiley & Sons Ltd, FREEPOST, Baffins Lane, CHICHESTER, West Sussex PO19 1YP No [illegible]

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Astro-transporter

A new game for the unexpanded Vic20 by Benedict Maccarty

In *Astro-transporter* your objective is to travel across deep space to a space station approximately 1,300 light years away. However, the route is a dangerous one containing many asteroids, meteors, planets and stars. On the way, you must pick up as much cargo as possible and also refuel — otherwise the fuel warning will sound, then 500 fuel units later the warning will become a continuous tone telling you that you are out of fuel and control.

Apart from fuel and cargo, the only other thing you are allowed to collide with is space dust, which is represented by multi coloured full stops. If you fail to do this, you will lose one of your three lives, graphically represented after each loss.

After 500 light years, you will come to a section of space entirely consisting of fuel and cargo. This is where the good pilots pick up most of their profit. However, another 500 light years on, you reach normal space again but this time with even more asteroids. After navigating through 300 light years of this, the space stations start to appear with which you must dock, hoping it is friendly not hostile. If friendly, you will than be told your profit from selling excess fuel and the cargo, and the time you took. If the base is hostile, you will be captured along with your profit.

The *Z* and *C* keys move left and right respectively, each using 10 units of fuel per move. The *B* key will send you into hyperspace, at the expense of 50 units of fuel, relocating you randomly. As a final resort, you have your short range laser which destroys everything in the space directly in front of your ship at a cost of 250 units of precious fuel.

Program notes

10-60	Setting up variables etc
110-262	Screen set up and collision checks
265-350	Distance travelled checks and variable up-date
5000-5160	Instructions
7000-9050	Subroutines for graphics of planets and stars
10000-10130	Ship destroyed routine
20000-20100	Cargo left routine
50000-50050	Controls
60000-60050	Space station graphic subroutine
62000-62110	End of journey results

Warning: The control keys have been given automatic repeat. ■



```
10 LL=3 LY=0 CG=0 F=1000 POKE650,255 B$="[illegible]
   [illegible]" PP=0
30 GOSUB5000
40 POKE 36878 15 POKE36877 254 POKE36879,8 PRINT "[illegible]"
70 PRINT"[illegible]"
80 A=7900 B=11 D=8164
90 DEFFNR(X)=INT(RND(1)*X) TI$="000000" CT=30720
110 FORJ=0TO22 PRINT NEXT
120 POKED+FNR(22) 42
130 X=FNR(22) POKED+X,46 POKED+X+CT,FNR(6)+1
131 X=FNR(22) POKED+X 46 POKED+X+CT,FNR(6)+1
132 POKEFNR(21)+D 42
133 IFLY>1000THENPOKEFNR(21)+D 42
135 IFFNR(50)=10THENX=FNR(22) POKEX+D 81
    POKEX+D+CT FNR(6)+1
140 IFFNR(25)=22THENPOKED+FNR(22),87
150 IFFNR(50)=33THENPOKED+FNR(22) 102
151 IFF<500THENPOKE 36876 135
160 IFFNR(50)=33THENGOSUB9000
170 IFFNR(100)=22THENGOSUB7000
180 IFPEEK(A+B)=160THEN10000
190 IFPEEK(A+B)=42THEN10000
200 IFPEEK(A+B)=223THEN10000
210 IFPEEK(A+B)=95THEN10000
220 IFPEEK(A+B)=105THEN10000
230 IFPEEK(A+B)=233THEN10000
240 IFPEEK(A+B)=81THEN10000
250 IFPEEK(A+B)=102THENFORN=50TO0STEP-1 POKE 36876,
    128+N NEXTN POKE 36876 0 F=F+
200
255 IFPEEK(A+B)=160THEN10000
260 IFPEEK(A+B)=87THENCG=CG+1 FORN=0TO50 POKE 36875
    128+N NEXT POKE 36875,0
261 IFPEEK(A+B)=223THEN10000
262 IFPEEK(A+B)=86THEN82000
265 POKEA+B 58
270 IFLY=500THENGOSUB20000
271 POKED+FNR(22) 42
280 IFLY>1300THENGOSUB60000
282 FORT=0TO20 NEXTT
295 POKEA+B 32
300 PRINT "[illegible]"
301 IFF>0THENPOKE36876 0
310 GOSUB50000
312 PRINT "[illegible]FUEL="F"LY=" LY
330 LY=LY+1
340 F=F-1
350 GOTO120
5000 POKE 36879 90
5010 PRINT "[illegible]THIS IS THE GAME OF
5020 PRINT "[illegible]RETRO-TRANSPORTER
5030 PRINT "[illegible]AVOID THE METEORS
5040 PRINT "[illegible]AND PLANETS TO
5050 PRINT "[illegible]DELIVER THE CARGO
5060 PRINT "[illegible]COLLECTED ON THE
5070 PRINT "[illegible]VOYAGE.
5080 PRINT "[illegible]Z=LEFT C=RIGHT
5090 PRINT "[illegible]-HYPERSPACE
5100 PRINT "[illegible]REMEMBER TO PICK UP
5110 PRINT "[illegible]EL
5120 PRINT "[illegible]
5130 PRINT "[illegible]FUEL
5140 PRINT "[illegible]HIT A KEY TO START
5150 GETA$ IFA$=""THEN5150
[illegible]
```

```
[illegible]
9000 X=FNR 20 [illegible]FNR(6)+1
9010 POKED+X 35 POKED+X+CT [illegible]
9020 [illegible] POKED+2[illegible]
9030 POKED 2[illegible] POKED 21[illegible]CT [illegible]
9040 [illegible] 105 POKED+X+1+CT 2
9050 RETURN
10000 POKE A+B [illegible]
10010 POKE 36877 [illegible]
10020 FORL=1[illegible]STEP 1
10030 POKE 36878 L
10040 FORM=1TO300
10050 NEXTM
10060 NEXTL
10070 POKE 36877 0
10080 POKE 36878 0
10085 LL=LL-1 IF LL=0THEN10[illegible]
10086 PRINT "[illegible]" FORN=1TOLL PRINT[illegible] PRINT "[illegible]" NEXT
10087 FORN=1T[illegible]000 NEXT
[illegible]
[illegible] PRINT "[illegible]TIME=[illegible]VAL TI$
[illegible] PRINT "[illegible]
[illegible] END
20000 FORN=1TO[illegible] PRINT NEXT
20010 [illegible]
20011 IFPEEK(A+B[illegible])THENF=F+[illegible]
20012 IFPEEK(A+B)=[illegible]THEN[illegible]+1
20015 [illegible]
[illegible]
```

PHIL TATTON



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LORD HARRY Poor old Lord Harry, he's just spent a weekend at the country estate of his old school friend Dennis. He had a wonderful time but unfortunately he drank a little too much claret on Sunday night. He lost his way and fell asleep in the garden



SOFTWARE FOR THE DRAGON
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Masters of conflict

***David Kelly** talks to David Martin, one of the partners in Martech Games*

CONFLICT is a board game. But not an ordinary one. Being computer moderated, all of the mechanics of working the game is taken care of by a computer.

The idea of computer moderated board games is not new, but it is only with the advent of sub-£100 micros that it has become feasible for anyone to play them. No longer do you need to have access to a main frame computer.

Conflict was the first such game designed to work with the 16K ZX81. It was launched over a year ago by Martech Games, an Eastbourne-based company founded by David Martin and John Barry.

David is the one who put *Conflict* together. A former chemistry teacher, he has long been a keen board gamer. Like so many before him, he had submitted ideas to many of the traditional game manufacturers, only to have them turned down.

When the ZX81 came out, David immediately saw the possibilities. "The idea I started with," he says, "was to use the computer to replace the dice or cards found in most games.

The intention was not to write a game where one player battles against the computer — a *Space Invaders*. Instead, David wanted to design a game, with a board, in which a number of players could compete against each other and in which the computer is simply used to take out the donkey-work of, for example, being banker.

"There is an awful lot to be gained by playing against a number of evenly matched opponents," says David. "People are much more devious than computers. Once you get to know an ordinary computer game then you understand how it plays and it isn't ever going to surprise you.

"I wrote *Conflict* and I understand it completely, but when I play against other people I can never be certain of winning!

It all depends on how good your opponent is. When *Conflict* for the 16K ZX81 first appeared it was quite unlike anything else being sold for the machine.

Reaction to the game was universally favourable, although its sales were disappointing. "People didn't seem to know what to make of it — I think *Conflict* was ahead of its time."

David is undaunted and reckons that computer moderated games are beginning to come into their own. "There is a much greater interest in things other than arcade type games now — including strategy games like ours."

Conflict is available for the ZX81 and Spectrum — versions for the BBC, Dragon, Commodore 64 and Atari machines will be released shortly. And its successor, a different board game — but still computer moderated — *Galaxy Conflict* — will also be available for the same range of machines.

John Barry (left) and David Martin, co-founders of Eastbourne based Martech Games

Conflict is a strategy game played on a board with counters and controlled by instructions and prompts from a micro. The play involves capturing territory, surveying and drilling for oil, becoming wealthy, buying armies and munitions, capturing more territory and drilling again. The winner is either the first to get an army into the enemy city, or the player who controls the most territory after an agreed number of moves.

David's original idea was to develop a game for up to four players but the workings of it proved to be too complex. "It took three or four hours just to get started. It was back to the drawing board!"

So *Conflict* — which is a two player game — arose out of trying to simplify the whole thing.

"The beauty of a computer moderated game is that it can do things that conventional board games cannot. In *Conflict*, for example, you make money by drilling for oil. Neither player knows where the oil is and it is in a different place each time the game is played. Its location is determined randomly by, and known only to, the computer.

"Imagine trying to do that with a conventional game — turning over a card which says 'You have struck oil'," explains David. "It's just not the same."

Having designed the game, the fun really started — trying to get the package together. "Would you believe there is only one company in the country which makes plastic counters with numbers on?"

Now the games are ready, they will be marketed by Gemini — Colour Genie and TRS80 versions are also under way through an arrangement with Molymerx.

Martech is also producing some more conventional games for the Spectrum and Oric, as well as taking on a marketing role for Durell Software. Durell's *Harrier Attack* on the Oric goes on to the Spectrum and a new game for the Spectrum, *Scuba Diver*, and *Starfighter* for the Oric will be out soon.

Under its own banner, Martech will be selling an adventure for the Vic20 and Commodore 64 machines called *The Quest of Merravid* which, David claims, has quite a sense of humour.

Also, because of David's background, Martech has linked with a publishing company to produce some learning material which will be both educational and entertaining — designed for the home rather than for use in schools.

That is not to say that David has given up on computer moderated games. "There is another one I want to do. And it will definitely contain some arcade features.

"At various points in the game one player or the other will have to overcome some kind of arcade type obstacle, either against the computer or against the opponent.

"And it will be possible for the game to be played by only one player against the computer — but still making use of the board and pieces."

Says David: "When that comes out it will take computer-moderated games a stage further." ■

Reaching for the peak

***Brian Cadge** looks at the perils of climbing Everest in his latest review of Dragon software*

Four adventures, two arcade games and two utilities make up this look at the latest software for the Dragon 32. The general presentation of the programs has noticeably improved with this selection — four of the programs are supplied in book type or mini-video boxes — as has the accompanying literature.

Franklin's Tomb from Salamander Software is a text only adventure game. The difference is that all of the illustrations of the places of interest are in an 18-page manual supplied with the tape. The scenario states that you, as *Dan Diamond*, a private eye down on his luck, enter the tomb. Whoever wrote the introduction certainly has a sense of humour; here's a short quote from the text:

"Down on the street, I got out a cigarette and waited for a cab. A man walked past me.

"You got a light, Mac?" I asked.

"No, but I got a dark brown overcoat," he replied. I split his lip." And so it continues with every corny joke you can think of.

The program itself uses the whole 32K of memory for its many rooms and corridors. The game will recognise 50 verbs and 80 nouns. The screen display is formatted and is excellent — the left is used for a description of where you are, the right for an inventory of what you are currently carrying and the bottom three lines are used for communication between computer and player. There is also a useful *save game* facility, so that you can come back to the game at the same point at another time.

I cannot say too much about the game itself, as this would only spoil it for anyone playing it. Needless to say, the game involves exploring the rooms, collecting certain items and avoiding the booby traps. When you do eventually solve it, a message appears suggesting that you go out and buy their next adventure!

This program has that something about it which other adventures lack, making you want to stay up to all hours in a vain attempt to solve the puzzle. At £9.95 *Franklin's Tomb* is worth every penny — this will become a classic. A help sheet is also available from Salamander for anyone who is agonising over the game and whose patience has run out!

Moving on to the other offering from Salamander featured here — *Everest* is a role play adventure game which involves sending a team up Mount Everest or one of two other easier mountains. The option of climbing in the Spring or Autumn effectively allows you to vary the skill level of the game and you can also decide what supplies go to base camp.

The expedition consists of six climbers represented by their initial letter. You decide whether they climb alone or in pairs, with or without oxygen and what supplies they take with them to the next camp. This is all done via error trapped selection routines on the screen. When all details have been finalised, the men set out and the screen switches to a high res black and white display of the mountain showing the climbers and how much time they have left before they must reach camp. The display is somewhat simple but useful.

At any time, you can call up an information service to find out such things as the weather forecast and medical reports on the climbers. The simulation is very accurate — let the climber go short of food, or oxygen, or expose him to the elements for too long and you have a death on your hands. If three or more members die, the attempt is abandoned. Your score and a rating is shown at the end of the game.



All is explained in the instruction sheet which also has some useful hints for avoiding disaster. I have to say that on first playing the game I wasn't very impressed but after several attempts I am now a dedicated fan. The price is a very reasonable £7.95 for a cassette in a book type or mini video box as used for all Salamander's games. Both of the games featured here carry the Dragon Data seal of approval.

Grandad's Will by Intersoft is the cheapest adventure in this review at £4.00 and this is reflected in its packaging — the box is glued to a sheet of cardboard with no playing or loading instructions. The game involves racing round a house trying to find the will before someone else does. Once again, this is text only.

I was not very impressed with this game from the start. The commands which must be given to the computer are pedantic to say the least — often you will be stuck trying to find the sentence which the program will accept, even if you know what you want to do.

The final adventure game is *Adventure Plus* from Premier Microsystems. This again comes in a mini-video box with some instructions on the back, and is once again a text only adventure with two word instructions to the computer. The screen layout is nowhere near as good as Salamander's — for example, you have to keep typing *List* to see what you are carrying and the descriptions keep scrolling off the screen. There is no *Save* game option either.

The game is set in and around an old house which you explore in search of treasures; typing *Help* occasionally gives a hint on what to do next in times of despair! The game is not as compelling as *Franklin's Tomb* and doesn't seem to have as many locations to explore (although I may be doing it an injustice here as I haven't managed to solve this one yet); response times are however faster.

As usual, there is an obstacle to get past before starting the game proper — in this case a gate. Getting the actual word the computer wanted is the main problem, not finding out what you need to do. When lost in the forest at the start of the game you are allowed to go in any direction, but whichever direction you take you *always* end up back at the gate; is this a bug? If it isn't, it seems a bit silly to me!

Although Premier are the manufacturers of a disc system for the Dragon, there is no mention of how to transfer the program to disc for drive owners, although this would be simple enough as the program is written entirely in Basic. *Adventure Plus* will set you back £7.95 and, with a little tidying up of the display, would be a decent addition to your collection.

Shard's Software are quite well known for their compilation tapes; the latest is called *Family Programs* which includes eight programs — games, utilities and educational software. As is often the case, the programs are a mixture of good and not so good and some which should never have found their way on to the market at all.

Worthy of a mention are *Tunes*, *Maths* and *Quiz*. In the first, you name a tune from any of the 100 or so in the memory — a simple enough game, but made more enjoyable by the number of different songs available. There is also a graphic display of the notes as they are played.

The maths program is the sort of thing you can leave five-year-olds playing on a rainy afternoon, although at the highest level many adults would have trouble with some of the questions. The program asks simple sums like $5 + 2 = ?$ and gives you

a few seconds to answer. The score is given at the end. The use of giant coloured letters improves its appeal for youngsters. A friend of mine once wrote a program called *Kiddie Maths* which was very similar to this and if he can write it anyone can — this really is the sort of thing users should be writing for themselves.

Quiz is, surprise surprise, a quiz program with 750+ questions. Not really suitable for the young or even the average adult as some of the questions are, to say the least, hard. There is also a two player option which needs joysticks and uses a ghastly entry routine which is best forgotten.

None of these programs would be worth buying separately, but on a compilation tape for £6.95 they may be worth consideration. The other programs on the tape are *Battle* (bad), *Finance Sarah* (a terrible version of *Simon*), *Oddjob* (utilities) and *Ringo* (ghastly).

J Morrison's arcade games for the Dragon are usually worth keeping an eye open for (remember *Bonka* and *Vultures*?) and the latest game *Droids* is no exception.

100 percent machine code

Written in 100 percent machine cobe the program uses high res colour graphics and sound (although the sound seems like it was left over from the *Vultures* game). The idea is to shoot down the *Droids* before they manage to remove the bricks which hold the bombs. You lose a life if a bomb drops or you are hit by *Droid* fire — all good *Space Invader* stuff! Once three lives have been lost the game ends. If you manage to clear the screen you get a bonus life and score and go on to another screen of the same thing. Unfortunately there is no way of altering the skill level or entering your name with the high score. Two versions of the game are on each side of the tape, the first is a joystick version, the second a keyboard version.

The graphics are fast and very well animated, as expected from a Morrison game, and the packaging is excellent — yet again in a mini video box with colour inlay. Even though the game is excellent compared with some others on the market I don't think that *Droids* is quite as infectious as *Vultures*, albeit more original.

I'll wind up this review with a look at a couple of utilities for the Dragon. If you want to keep one step ahead of the bank manager then the *Personal Banking System* from Hilton Computer Services may be just the ticket! A 12-page user's manual describes in detail how to use the menu driven program and also lists exactly how the program works. Using Basic data files you can keep track of your bank account, standing orders and cheque accounts. Entry is by menus but is not error trapped and it is easy to cause an error and be thrown back into Basic. This sort of standard error trapping really determines just how serious a package is.

Hilton offer a unique after sales service and welcome suggestions for improvement from users. A 64K version and Disc version are currently under consideration.

And finally to something completely different: the *Dasm* assembler cartridge from Compusense. This was probably the first assembler on a cartridge available for the Dragon 32 and is still one of the cheapest. An extensive user's guide is included but as it points out this is not meant to be a text book on 6809 programming. The example programs are however useful for beginners. The assembler is a two pass type which means that it can handle labels of any length (an annoying feature is having to put an @ before any label) as well as expressions involving addition and subtraction.

All of the 6809 addressing modes are supported and the standard assembler syntax is used for them all except for indirect addressing where round brackets are used instead of square ones. According to Compusense this is because the Dragon doesn't have square brackets — this is wrong, try shift down arrow and shift right arrow!

The cartridge also supports a number of directives or commands to tell the assembler how to display the results, either to screen or a printer. You may also reserve memory and create data tables. Programs are entered in source code as in Basic as *Dasm* does not interrupt Basic and only operates when *Executed*. This avoids having to learn a new editor and also means the author of the cartridge didn't have to bother with input routines.

Any errors found are printed in reverse video, to make them show up in the listing, and are full text and very easy to understand. Once finished, programs can be saved and loaded either as source code using *Cload Csave* or as machine code using *Csavem/Cloadm*.

There seems to be only one bug in the program — if you forget an *End* statement the assembler hangs up and you have to press *Reset*.

A very useful 6809 reference card is also included with the package for quick reference of the syntax of any instruction. I have been using a combined *Dasm Demon* cartridge for sometime before this review and have been very pleased with it. *Demon* is a monitor which can be used to debug machine code programs. It is also available separately (see *PCW* Vol 2 No 4 for a full review of *Demon*).

An assembler is essential for anyone seriously interested in machine code programming and you will have to go far before finding one better value than *Dasm* at £16.95 for a cartridge. Cartridge versions have the advantage over cheaper tape programs that they use very little Ram. *Dasm* is a very quick assembler in comparison with some others, most programs take less than a minute to assemble.

Once again, adventure games seem to dominate this review. On a machine with the Dragon's graphics capabilities, one would expect more graphics to be included, after all text only adventures work equally well on a ZX81 to an Apple. As I said earlier, the general standard of presentation has improved beyond all recognition. This is probably due to the fact that more of these programs are being sold in shops rather than mail order only. Take care though that you are not just buying a pretty box — the program itself is the most important thing! ■

Supplier	Program	Price	Value (1-10)
Salamander Software 27 Ditching Rise Brighton East Sussex BN1 4QL	*Franklin's Tomb* *Everest*	£9.95 £7.95	8 7
Intersoft 4 Craig Place Aberdeen	*Grandad's Will*	£4.00	2
Premier Microsystems 208 Croydon Road Anerley London SE20 7YX	*Adventure Plus*	£7.95	7
Shards Software 10 Park Vale Court Vine Way Brentwood Essex CM14 4UR	*Family Programs*	£6.95	5
J Morrison (Micros) 2 Glensdale Street Leeds LS9 9JJ	*Droids*	£6.95	8
Hilton Computer Services 14 Avalon Road Orpington Kent BR6 9AX	*Personal Banking System*	£9.95	8
Compusense Ltd Po Box 169 Palmers Green London N13 5XA	*DASM Assembler (Cartridge)*	£18.95	8

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Breaking the sound barrier . . .

***Peter Bartley** looks at sound effects in the fourth of a six-part series for the Vic20*

Possibly the most difficult thing about writing a game is thinking up new sound effects With four voices there should be a whole range of wierd and wonderful noises issuing from our trusty Vics but quite frankly there aren't For example I don't know about you but I'm fed up with boring hiss when I blow up a meanie The following program gives a cute ouch! sounding noise instead

```
10 FOR A  15 TO 0 STEP  4
20 POKE 36874 180 + A  POKE 36878 A
30 NEXT
```

See? A little more interesting and what's more very simple Actually decaying note and volume is a useful technique when creating sound effects

Maybe when experimenting you've used a single *For Next* loop to create siren-type noises Have you ever considered using 2 3 or even 4 loops to create more complex effects using the value of one loop for the step length of another? Try Program 1

Be careful when "nesting" loops in complicated expressions Make sure they *Next* in the right order

There are many different variations on this metho For example one voice ascending the other descending and so on Use your imagination

Another interesting technique is to rapidly *Poke* voices on and off Mess around with Program 2

Fairly good huh? Try *Poking* the volume on and off as well

Page 135 of the Vic manual states that it is possible to write-in sound effects which do not halt any animation going on at the time But there's no need to buy another book to find out how Type in Program 3

Before Running the program you should have guessed that it moves a block very quickly along the top line of the screen Add

```
35 POKE 36878 A  7480
```

The animation doesn't stop during the noise How? All we are doing is simply deriving our values to *Poke* into 36876 from the values producing the movement. Change the 7480 in line 35 to 7470 See what I mean? Program 3 gives the basic technique work round it and you'll soon be producing complex noises

However you must realise that however well written your program *Poking* sound (or any) registers still tends to slow down animation Try

```
10 PRINT [CLR] POKE 36878 15 TI$ - 000000
20 FOR A  128 to 255 PRINT HOME A
30 NEXT PRINT TI$
```

Around one second right? Now add

```
25 POKE 36874 A POKE 36875 A POKE 36876 A
40 POKE 36878 0
```

See? Almost 3-4 times as slow (I say 3-4 because *TI$* doesn't work in half-seconds) So any game involving sound effects is going to be slowed down to a certain degree Most of the time this is bearable (or doesn't matter) unless there is a lot of animation in which case it becomes tediously slow

VICTRICK No 4 Normally to change from upper to lower case graphics within a program you must Poke 36869 242 Here's a trick which lets you change within a Print statement! If you wish to Print XYZ in lower case type Print as normal but leave a space between the speech marks and the first letter (ie X) Return the line and move the cursor up to the extra space you put in Press the [RVS ON] key and type N Return immediately A reversed N should have appeared and should not disappear from the inverted commas when listed Running the line gives xyz (nb in lower case) To change from lower to upper case? Yes, you've guessed I Type [SHIFT]N instead of just N ! Try and find other Special Print Characters — There are a few!

Finally a quick word about colour Ever wished you could remember all the screen and border combinations? Well here's one way to do it

Pick a screen colour and a border colour call them *S* and *B* respectively Find the numeric values of the colours you have chosen from the Vic keyboard — as you would when *Poking* colour on to the screen (ie Black = 0 White = 1 etc) Then type in the following *Poke 36879 (16*S) or B or B* substituting your values for *S* and *B*

You can in fact produce all the colour combinations by this method since the value for light blue is simply the value for blue plus eight light green the value for green plus eight and so on. You can't have light black or light white so the numeric values 8 and 9 are assigned to orange and light orange Also remember that the value of *B* (border colour) cannot exceed 8

Another interesting colour fact is that location 646 holds the value of the current colour code Try *Poking* different values here This is one alternative to using colour commands within *Print* statements

VITRICK No. 5 Find that editing programs is becoming a little slow? Well to speed things up a little when moving your cursor around Poke 37159 with any number less than 50 (40 is ideal) Just for fun Poke 650,250 then Poke 37159 5 and try some typing

Next week we'll be looking at music as opposed to sound effects including random music No don't run for cover Yes I know it sounds pretty horrendous at the best of times but this program at least sounds reasonably tuneful ■

```
10 POKE 36878,15
20 FOR A = 20 TO 1 STEP − 1
30 FOR B = 235 + A TO 148 − A STEP − A
40 POKE 36876,B POKE 36874,B
50 FOR C = 1 TO A*10 NEXT
60 NEXT B,A POKE 36876,0 POKE
36874,0
```

Program 1

```
10 POKE 36878,15
20 FOR A = 240 TO 128 STEP − 1
30 POKE 36874,A POKE 36874,0
40 NEXT
```

Program 2

```
10 POKE 36878,15 POKE 36879,8
20 FOR A = 7680 TO 7701
30 POKE A,160
40 POKE A,32
50 NEXT GOTO 20
```

Program 3

The root of the problem

T Choy presents a program to solve cubic quartic and quadratic equations

I wrote the routines in this program for the practical purpose of accurately determining the roots of quartic cubic or quadratic equations Iterative methods are often inferior — apart from the need to know roughly the location of each root they are often unable to deal with complex roots without considerable effort

You are warned however not to apply all routines blindly Sometimes rather elementary algebraic considerations on an equation like

$x^4 - 4x^3 - 6x^2 + 13x + 10 = 0$

would immediately reveal that 5 & − 2 are the only two integer roots the remaining two must be irrational Your Spectrum will not lie but it may make you feel stupid!

On *Loading* respond to program prompts and questions on the screen Answer *Y* or *N* to questions and 2 3 or 4 for quadratic cubic or quartic This is a useful utility for other serious applications for a variety of other programs eg interpolations graphics and even games as they are quite fast All Rem lines can be deleted without affecting the program

The cubic routine uses two separate methods depending on the coefficients For certain coefficients it is convenient to use a trigonometric formula that evaluates the cube roots of unity For others it uses algebraic formulas that involve one-third roots

For the quartic routine a real root for a derived cubic equation is first solved with the Previous routine Thereafter the quartic is factorised into two quadratics that are solved using the first routine All these routines only handle real coefficients but they will yield real or complex roots

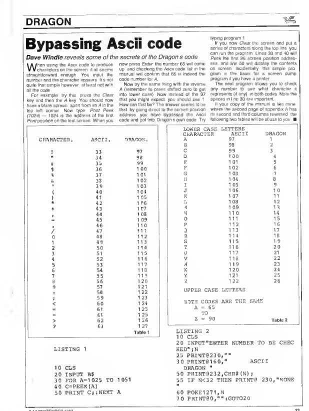
Your Spectrum will print out the coefficients of the equation you have entered, tell you how many real or complex roots there are and give them all to you There are error checks in the program designed to deal with awkward coefficients or cases where the formulas may yield inaccurate results In these cases you will be told to either rescale your coefficients or that you may have a reducible equation eg

$aX^3 + bX^2 + cX = 0$

You are invited to modify these programs to cater for complex coefficients though the task is fairly complicated sometimes with no close form solutions ■

```
 80 REM ----------------------
 81 REM     MASTER  PROGRAM
 82 REM ----------------------
100 LET A$=" SOLUTION OF     QUARTIC, CUBIC & QUADRATICS"
110 LET B$="     (c) C. Choy      (c)1983"
115 DIM C$(3,10): LET C$(1)="QUADRATIC": LET D$(2)="CUBIC": LET D$(3)="QUARTIC": DIM R$(2,9): LET R$(1)="Real": LET R$(2)="Complex"
120 LET C$="Press [illegible]"
130 PRINT AT 9,10;A$: PRINT AT 16,14;B$: PRINT AT 19,5;C$
140 PAUSE 5000: IF INKEY$=CHR$ 13 THEN GO TO 155
150 GO TO 140
155 CLS : PRINT "This Program is designed for thesolution of Quartic, Cubic and Quadratic Equations. As you maywell know,algebraic equations ofdegree less than 5 can be solved by formulas without recourse to numerical iteration.": PRINT AT 20,5;C$
158 IF INKEY$=CHR$ 13 THEN GO TO 160
159 GO TO 158
160 CLS
165 PRINT AT 10,0;"Enter Highest Power of Equation 2,3 or 4"
170 INPUT N
175 IF N<>2 AND N<>3 AND N<>4 THEN GO TO 170
180 IF N=2 THEN GO SUB 300
190 IF N=3 THEN GO SUB 500
200 IF N=4 THEN GO SUB 800
250 IF N<>4 THEN GO SUB 1000: GO TO 2000
255 IF N=4 THEN GO SUB 1100: GO TO 2000
300 REM ----------------------
301 REM QUADRATIC PROGRAM
302 REM ----------------------
305 CLS : PRINT "------------------------------To solve      2                  Ax  + Bx + C = 0 ------------------------------"
308 DIM A(2,2): DIM C(3)
310 INPUT "A=",C(3)
312 INPUT "B=",C(2)
314 INPUT "C=",C(1)
320 LET A=C(3): LET B=C(2): LET C=C(1)
330 LET Q=B*B-4*A*C: IF Q<0 THEN GO TO 380
360 LET A(1,1)=(-B+SQR Q)/(2*A)
370 LET A(2,1)=(-B-SQR Q)/(2*A): GO TO 400
380 LET A(1,1)=-B/(2*A): LET A(2,1)=A(1,1)
390 LET A(1,2)=SQR (-Q)/(2*A): LET A(2,2)=-A(1,2)
400 RETURN
500 REM ----------------------
501 REM CUBIC PROGRAM
502 REM ----------------------
505 CLS : PRINT "------------------------------To solve      3      2           Ax  + Bx  + Cx + D = 0 ------------------------------"
509 DIM A(3,2): DIM C(4)
510 INPUT "A=",C(4)
512 INPUT "B=",C(3)
513 INPUT "C=",C(2)
514 INPUT "D=",C(1)
530 LET A=C(4): LET B=C(3)/3: LET C=C(2)/3: LET D=C(1): LET Q=A*C-B*B: LET R=(3*A*B*C-A*A*D)/2-B*B*B
535 IF A=0 THEN PRINT "A=0 Please re-enter 2 you have a quadratic": GO TO 165
538 IF D=0 THEN PRINT "D=0 Please re-enter 2 ,you havea quadratic and one root is zero": GO TO 165
540 LET Q1=Q*Q*Q+R*R: LET T=1/3
550 IF Q1<0 THEN GO TO 650
560 LET S4=R+SQR Q1: IF S4<0 THEN LET S1=-(ABS S4↑T): GO TO 580
570 LET S1=S4↑T
580 LET S3=R-SQR Q1: IF S3<0 THEN LET S2=-(ABS S3↑T): GO TO 600
590 LET S2=S3↑T
600 LET X1=(S1+S2-B)/A
610 IF Q1<>0 THEN GO TO 630
620 LET X2=-(B+R↑T)/A: LET X3=X2: GO TO 730
630 LET E=-(S1+S2+2*B)/(2*A)
640 LET F=(S1-S2)*SQR (3)/(2*A): GO TO 740
651 LET MS=1
652 IF R<0 THEN LET MS=-1
670 LET QS=ABS Q: LET G=MS*R/SQR (QS↑3)
680 LET M=ACS G
690 LET M1=MS*2*SQR (-Q): LET J=M1*COS (M/3)
700 LET X1=(J-B)/A
710 LET J=M1*COS (M/3+2*PI/3): LET X2=(J-B)/A
720 LET J=M1*COS (M/3+4*PI/3): LET X3=(J-B)/A
730 LET A(1,1)=X1: LET A(2,1)=X2: LET A(3,1)=X3: GO TO 790
740 IF F<0 THEN LET F=-F
750 LET A(1,1)=X1: LET A(2,1)=E: LET A(2,2)=F
780 LET A(3,1)=A(2,1): LET A(3,2)=-A(2,2)
790 RETURN
800 REM ----------------------
801 REM QUARTIC PROGRAM
802 REM ----------------------
805 CLS : PRINT "------------------------------To solve"
806 PRINT "      4      3      2              Ax  + Bx  + Cx  + Dx + E = 0"
807 PRINT "------------------------------"
808 DIM W(4,2): DIM Z(5): DIM A(3,2): DIM C(4)
810 INPUT "A=",Z(5)
812 INPUT "B=",Z(4)
813 INPUT "C=",Z(3)
814 INPUT "D=",Z(2)
815 INPUT "E=",Z(1)
820 LET RM=Z(4)/Z(5): LET RN=Z(3)/Z(5): LET RD=Z(2)/Z(5): LET RQ=Z(1)/Z(5)
830 LET N=3: LET C(4)=8: LET C(3)=-4*RN: LET C(2)=2*(RM*RD-4*RQ): LET C(1)=-(RD*RD+RQ*(RM*RM-4*RN)): GO SUB 530: LET N=4
```

```
840 FOR I=1 TO 3
841 LET Y1=A(I,1)
842 LET P1=RM*RM/4+2*Y1-RN
843 LET P2=Y1*Y1-R0
850 IF A(I,2)=0 AND P1>=0 AND P
2>=0 THEN LET U=SQR P1: LET V=SQ
R P2: GO TO 857
855 NEXT I
856 GO TO 900
857 DIM A(2,2)
860 LET A=1: LET B=RM/2-U: LET
C=Y1+V: GO SUB 330
870 FOR I=1 TO 2: LET W(I,1)=A(
I,1): LET W(I,2)=A(I,2): NEXT I
875 DIM A(2,2)
880 LET A=1: LET B=RM/2+U: LET
C=Y1-V: GO SUB 330
885 FOR I=1 TO 2: LET W(I+2,1)=
A(I,1): LET W(I+2,2)=A(I,2): NEX
T I
888 LET M=0
890 FOR I=1 TO 4
895 IF W(I,2)<>0 THEN LET M=M+1
896 NEXT I
897 GO TO 950
900 PRINT "Please rescale x, n
umbers too  difficult to handle"
910 PRINT "Also check if your e
quation can be reduced to a lowe
r degree"
920 GO TO 2000
950 RETURN
1000 LET M=0
1010 FOR I=1 TO N
1013 IF A(I,2)<>0 THEN LET M=M+1
1015 NEXT I
1018 IF M<1 THEN LET M=1: IF M/2
 THEN LET M=2
1020 PRINT "where"
1030 IF N=2 THEN PRINT "A=",C(3
), "B=",C(2): PRINT "C=",C(1)
1032 IF N=3 THEN PRINT "A=",C(4
), "B=",C(3): PRINT "C=",C(2), "D="
,C(1)
1040 IF N=2 OR (N=3 AND M=1) THE
N PRINT "has ",N,A$(M)" roots"
1042 IF (N=3 AND M=2) THEN PRINT
 "has 1 Real and 2 Complex root
s"
1045 IF (N=2 AND M=1) OR (N=3 AN
D M=1) THEN GO TO 1070
1050 IF (N=2 AND M=2) THEN PRINT
 "x1=",A(1,1)," + i ",ABS A(1,2)
1052 IF (N=3 AND M=2) THEN PRINT
 "x1=",A(1,1)
1060 PRINT "x2=",A(2,1)," - i ",
ABS A(2,2)
1062 IF N=3 AND M=2 THEN PRINT
"x3=",A(3,1)," + i ",ABS A(3,2)
1065 RETURN
1070 PRINT "x1=",A(1,1),"x2=",A
(2,1)
1072 IF (N=3 AND M=1) THEN PRINT
 "x3=",A(3,1)
1075 RETURN
1100 PRINT "where"
1105 PRINT "A=",Z(5),"B=",Z(4):
 PRINT "C=",Z(3),"D=",Z(2): PRIN
T "E=",Z(1)
1110 IF M=0 THEN PRINT "has 4 r
eal roots"
1115 IF M=2 THEN PRINT "has 2 r
eal and 2 complex roots"
1120 IF M=4 THEN PRINT "has 4 c
omplex roots"
1125 IF M=0 THEN PRINT "x1=",W(
1,1),"x2=",W(2,1): PRINT "x3=",W
(3,1),"x4=",W(4,1)
1130 IF M=2 AND W(4,2)<>0 THEN P
RINT "x1=",W(1,1),"x2=",W(2,1):
 PRINT "x3=",W(3,1)," + i ",ABS
W(3,2): PRINT "x4=",W(4,1)," - i ",
 ABS W(4,2)
1135 IF M=2 AND W(2,2)<>0 THEN P
RINT "x1=",W(3,1),"x2=",W(4,1):
 PRINT "x3=",W(1,1)," + i ",ABS
W(1,2): PRINT "x4=",W(2,1)," - i "
,ABS W(2,2)
1138 IF M=4 THEN PRINT "x1=",W(
1,1)," + i ",ABS W(1,2): PRINT "x
2=",W(2,1)," - i ",ABS W(1,2): PR
INT "x3=",W(3,1)," + i ",ABS W(3,
2): PRINT "x4=",W(4,1)," - i ",AB
S W(4,2)
1140 RETURN
2000 PRINT AT 20,2;"Do you wish
to continue with ";AT 21,11;D$(N-
1);"?"
2010 IF INKEY$="Y" OR INKEY$="y"
 THEN GO TO 100+(N-2)*10
2020 IF INKEY$="N" OR INKEY$="n"
 THEN GO TO 150
2030 GO TO 2010
```



Bypassing Ascii code

***Dave Windle** reveals some of the secrets of the Dragon s code*

When using the Ascii code to produce characters on the screen it all seems straightforward enough You input the number and the character appears It s not quite that simple however at least not with all the code

For example try this press the *Clear* key and then the *A* key You should now have a blank screen apart from an *A* in the top left corner Now type *Print Peek (1024)* — 1024 is the address of the first *Print* position on the text screen When you now press *Enter* the number 65 will come up and checking the Ascii code list in the manual will confirm that 65 is indeed the code number for *A*.

Now try the same thing with the inverse *A* (remember to press shifted zero to get into lower case) Now instead of the 97 that you might expect you should see 1 How can that be? The answer seems to be that by going direct to the screen position address you have bypassed the Ascii code and got into Dragon s own code Try typing program 1

If you now *Clear* the screen and put a series of characters along the top line you can run the program Lines 30 and 40 will *Peek* the first 26 screen position addresses and line 50 will display the contents on screen Incidentally this simple program is the basis for a screen dump program if you have a printer

The next program allows you to check any number to see what character it represents (if any) in both codes Note the spaces in line 30 are important.

If your copy of the manual is like mine where the second page of appendix A has its second and third columns reversed the following two tables will be of use to you ■

CHARACTER.	ASCII.	DRAGON.
!	33	97
"	34	98
#	35	99
$	36	100
%	37	101
&	33	102
'	39	103
(	40	104
)	41	105
*	42	106
+	43	107
,	44	108
-	45	109
.	46	110
/	47	111
0	48	112
1	49	113
2	50	114
3	51	115
4	52	116
5	53	117
6	54	118
7	55	119
8	56	120
9	57	121
:	58	122
;	59	123
<	60	124
=	61	125
=	61	125
>	62	126
?	63	127

Table 1

LOWER CASE LETTERS

CHARACTER	ASCII	DRAGON
A	97	1
B	98	2
C	99	3
D	100	4
E	101	5
F	102	6
G	103	7
H	104	8
I	105	9
J	106	10
K	107	11
L	108	12
M	109	13
N	110	14
O	111	15
P	112	16
Q	113	17
R	114	18
S	115	19
T	116	20
U	117	21
V	118	22
W	119	23
X	120	24
Y	121	25
Z	122	26

UPPER CASE LETTERS

BOTH CODES ARE THE SAME
A = 65
TO
Z = 90

Table 2

LISTING 1

```
10 CLS
20 INPUT B$
30 FOR A=1025 TO 1051
40 C=PEEK(A)
50 PRINT C;:NEXT A
```

LISTING 2

```
10 CLS
20 INPUT"ENTER NUMBER TO BE CHEC
KED";N
25 PRINT@230,""
30 PRINT@160,"      ASCII
  DRAGON "
50 PRINT@232,CHR$(N);
55 IF N<32 THEN PRINT@ 230,"NONE
"
60 POKE1271,N
70 PRINT@0,"":GOTO20
```

A galaxy of stars

***Christopher Bowerman** presents a 3D star cluster program for the BBC model A or B*

If you have ever envied the spinning 3D star constellations often seen on tv then this program will allow you to do a similar thing — though not quite as fast unless you have a second processor for your BBC micro or access to a CRAY1!

The program uses *Vdu19* to store two screens of stars and to flip between them. New positions for the stars are calculated and invisibly plotted while the old ones are visible. The newly rotated star positions are then revealed, the old ones are erased and new ones invisibly plotted in their place. These stars are then revealed and the process continues.

Procinit randomly selects the 3D co-ordinates for the stars — these points are scaled for perspective (*Procscale*) and are then plotted (*Procsketch*). *Procroy* then rotates the old positions about the *Y* axis.

The arrays *XYZ* hold the 3D co-ordinates while *A* and *B* hold the scaled two-dimensional positions for plotting on screen. *A1* and *B1* hold the screen positions of the old array to be erased. *P* on line 180 is the number of stars in your galaxy and it can be varied freely (but the program runs more slowly the larger the galaxy — try 12).

If you have a 32K machine, why not convert the program to *Mode2* and flip between four screens — this should give a better impression of speed. You could also try inputting actual data into the arrays at line 220 and watch a real galaxy rotate! If line 110 is deleted no erasing takes place and a juggling illusion will be seen. The variations are almost endless! ■

```
10REM 3D STAR CLUSTER by C.BOWERMAN
20REM (c) C.BOWERMAN JAN.1983
30REM FOR MODEL A OR B BBC-micro
40C=0
50MODE5
60PROCINIT
70C=C+1:IF C>2 C=1:REM LAYER FOR PLOT
80PROCSCALE
90GCOL1,C:REM PLOT ON LAYER
100PROCSKETCH
110FOR Q=1 TO P:GCOL2,C:PLOT69,A1(Q),B1(Q):NEXT:GCOL1,C:REM ERASE INVISIBLE ST
   ARS
120FOR Q=1 TO P:A1(Q)=A(Q):B1(Q)=B(Q)::NEXT
130PROCROY
140GOTO70
150END
160DEFPROCINIT
170RO=RAD(10):REM DEGREES OF ROTATION
180P=2:REM NO. OF STARS
190REM MAXIMUM VALUES FOR X AND Y
200MX=1000:MY=1000:CX=MX/2:CY=MY/2
210DIMX(P),Y(P),Z(P),A(P),B(P),A1(P),B1(P)
220FORQ=1TOP:X(Q)=RND(300):Y(Q)=RND(300):Z(Q)=RND(300):NEXT:REM PICK (X,Y,Z) F
   OR STARS
230ENDPROC
240DEFPROCSCALE
250REM SCALE FOR PERSPECTIVE
260FORF=1TOP
270SF=444/(Z(F)+666)
280X=X(F)*SF+CX
290Y=Y(F)*SF+CY
300IF (X>MX ORX<0) OR(Y>MY OR Y<0) GOTO320
310A(F)=X:B(F)=Y
320NEXTF:ENDPROC
330DEFPROCSKETCH
340IF C=1 VDU19,1,7,0,0,0,19,2,0,0,0,0,19,3,7,0,0,0:REM TURN LAYER ONE "ON"
350IF C=2 VDU19,2,7,0,0,0,19,1,0,0,0,0,19,3,7,0,0,0:REM. TURN LAYER TWO "ON"
360FORQ=1TOP:REM PLOT STARS
370MOVEA(Q),B(Q):PLOT69,A(Q),B(Q)
380NEXT
390ENDPROC
400DEFPROCROY:REM ROTATE ABOUT Y AXIS
410FORF=1TOP
420X=X(F)*COS(RO)-Z(F)*SIN(RO)
430Z=Z(F)*COS(RO)+X(F)*SIN(RO)
440X(F)=X:Z(F)=Z
450NEXT:ENDPROC
```


FIVE NEW GAMES FOR THE 64
(see list below for details)
HI:00000
TIME DESTROYERS for the expanded Vic 20 (any RAM)
ATOM SMASHER
103 SCORE HIGH 1121
POWER BLASTER for the unexpanded Vic 20
SCORE 201020 HI 230020
SPACE FORTRESS for the unexpanded Vic 20
GAMES THAT ARE HARD TO BEAT
UNEXPANDED VIC 20
Mind Twisters £4 99
Power Blaster £5 99
Shark Attack £5 99
Space Fortress £5 99
Space Attack £5 99
Atom Smasher £6 99
Pedes and Mutants £6 99
Multisound Synthesiser £6 99
Martian Raider £6 99
EXPANDED VIC 20
Time Destroyers £6 99
Moons of Jupiter £7 99
ADVENTURES FOR THE VIC 20
The Golden Apple of Zeus (8K or 16K) £4 99
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computer

Functions of eight

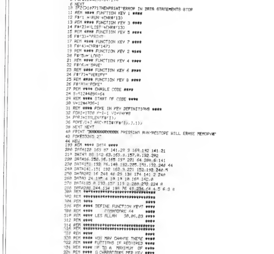
***Les Allen** explains how to program the eight function keys on the Commodore 64*

This short program enables the eight function keys to be programmed in functions of up to eight characters. The functions that are shown in the program may be changed prior to running the program. Alternatively line 44 may be changed to *End* which will allow changes to be made without the program clearing itself.

The Rem statements contained in the listing should enable the workings to be understood.

Program notes

0	Turn off screen
2-8	Read machine code data into decimal location starting at 49215
10	Trap if data is less than or greater than 10771 (sum of data)
12	Function key 1
14	Function key 3
16	Function key 5
18	Function key 7
20	Function key 2
22	Function key 4
24	Function key 6
26	Function key 8
32 36	Key in function key data into decimal location starting at 49151
40	Reminder statement
42	Turn on screen
200-280	Machine code data



```
0 POKE53265 11
2 FORI=0TO92
4 READA Z=Z+A
6 POKE12*4096+64+I,A
8 NEXT
10 IFZ<>10771THENPRINT"ERROR IN DATA STATEMENTS STOP
11 REM **** FUNCTION KEY 1 ****
12 F$(1 = RUN +CHR$(13)
13 REM **** FUNCTION KEY 3 ****
14 F$(2)= LIST +CHR$(13)
15 REM **** FUNCTION KEY 5 ****
16 F$(3)="PRINT
17 REM **** FUNCTION KEY 7 ****
18 F$(4)=CHR$(147)
19 REM **** FUNCTION KEY 2 ****
20 F$(5)= LOAD'
21 REM **** FUNCTION KEY 4 ****
22 F$(6)= SAVE'
23 REM **** FUNCTION KEY 6 ****
24 F$(7)="VERIFY"
25 REM **** FUNCTION KEY 8 ****
26 F$(8)= POKE"
27 REM **** ENABLE CODE ****
28 S=512*4096+64
29 REM **** START OF CODE ****
30 V=12*4096-1
31 REM **** POKE IN KEY DEFINITIONS ****
32 FORI=1TO8 K=I-1 VI=V+K*8
34 FORJ=1TOLEN(F$(I))
36 POKEVI+J ASC(MID$(F$(I),J,1))
38 NEXT NEXT
40 PRINT "XXXXXXXXXXXX PRESSING RUN/RESTORE WILL ERASE MEMORY"
42 POKE53265 27
44 NEW
199 REM **** DATA ****
200 DATA120 169 87 141,20 3 169 192 141 21
210 DATA3 88 162 63,169,0,157,0,192 202
220 DATA16,250,96,165 197 201 64 208 6 141
230 DATA1?1 192 76,148 192,205,151,192 240 44
240 DATA141,151 192 162 3 221 152 192 240 5
250 DATA202 16 248 48 29 138 174 141 2 240
260 DATA3 24 10? 4 10 10 10 168 162,0
270 DATA185 0 192 157 119 2 200 232 224 8
280 DATA208 244 134 198 76 49 234 64 4 5 6 3 0
300 REM ********************************
302 REM ********************************
304 REM ****                        ****
306 REM **** DEFINE FUNCTION KEYS   ****
308 REM ****      COMMODORE 64      ****
310 REM **** LES ALLAN   30.05.83   ****
312 REM ****                        ****
314 REM ********************************
316 REM ********************************
318 REM ****                        ****
320 REM **** YOU MAY CHANGE THESE   ****
322 REM **** FUCTIONS IF REQUIRED   ****
324 REM **** UP TO A  MAXIMUM  OF   ****
326 REM **** 8 CHARACTERS PER KEY   ****
328 REM ****                        ****
330 REM ********************************
332 REM ********************************
```

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the Program of the Week double our new fee of £6 for each program published

Golf

on BBC Micro

This is a version of Amateur Golf for the BBC model B. Although written mainly in *Mode 2*, it can easily be adjusted for the model A. It makes use of the sound and colour graphics for the BBC and is a 3d version of a Par 3 Hole Game.

Instructions are included in the program as to how to play, and the game includes Fairway, Putting Green and Water features of Golf. There are nine holes of varying difficulties, some with the added bonus of a waterhole (lake). Up to nine players can play, and it could take you an hour, a day or weeks to master.

Program notes

Lines	
10-50	Define envelopes for sound, dimensions arrays and goes to the instruction procedures
60-70	Puts it into *Mode 2*, goes to the variables procedure, prints what hole it is and sets up the screen (*Procsetscreen*)
80-130	Lets you input in the values you want for your shot.
140-150	Resets the screen and lets you hit the ball
160	Goes to the procedure which moves the ball in the air
170	Checks to see if you have got a Hole in One
180-200	Goes to the Putting procedure and sees if you have a Birdie or a hole in more than two shots
210	Re-adjusts your score and returns to line 60 if the hole has not been finished by all the players
220-230	Prints the score so far and goes back to line 60 to start a new hole
240-310	Sets up the Fairway screen, defines characters and places the water on it if it is the correct hole to do so
320-340	Defines variables
350-450	Hits the ball up into the air, makes it smaller as it gets further away and checks to see if it has landed in the water
460	The Hole in One procedure
470-480	Checks to see if the ball has got on to the green — if it has then it works out the position of it on the enlarged green
490-520	Sets up the Putting Green screen
530	Lets you input how far away the ball is from the hole
540-640	Moves the ball, checks to see if it has gone in the hole — if it has then it works out the position of it on the enlarged green
650-640	The Birdie and Hole-in-whatever procedure
670-870	Instructions
880-920	Lets you input how many players there will be and what their names are
930-990	Prints each individual player's score (also works out if they are under, over or on par)
1000	Ends the game if that was the last hole
1010-1020	Returns to play the next hole
1030-1100	Prints out (and sounds) the title at the beginning of the game
1110-1150	Prints out the Waterhole
1160	Drops you a shot if you land in the water

```
10ENVELOPE1,1,0,0,0,0,0,0,120,11,  ,  ,
  126,126
20ENVELOPE2,120,0,0,0,12,12,1 ,127,-5,
  -5,-5,126,12
30DIMA$(10),B$(10),A%(9),B%(9),B(8)
40MODE7:VDU23;8202;0;0;0;:PROCtitle:
  VDU12:PROCinstr:scr=1
50V=1:I=RND(600)+2
60MODE2
70PROCvar:COLOUR2:PRINTTAB(7,10)"Hole
  ";scr:PRINTTAB(7,1 )A$(V):FORT=
  0TO1500:NEXT:PROCsetscreen
80Z=GET:IFZ  32THEN80
90MODE7:FORI=0TO1:PRINTCHR$145;CHR$1  ;
  CHR$1 1:TAB(14,1);CHR$141"Length":NEXT
100INPUTTAB(1,4)"Length of shot ";TAB
  (1,5) (screen is 1280)  B:IFB>1280
  ORB 0THENPRINT"Try again":GOTO100
110INPUT"Upward drive (ma  .9 0) "D:
  IFD 5 THENPRINT"Too much drive":
  GOTO110
120PRINTTAB(0)"Are these values correct
  (Y N)  ":F=GET:IFF  89ANDF  78
  THEN120
130IFF=78THEN90
140MODE2:PROCsetscreen
150Z=GET:IFZ  32THEN150
160PROCcircle
1  IFG=1THENSOUND1,1,100,10:MODE7:PRO
  Cholein:GOTO21
180  G    GOTO  :REMputt
190IF   THENMODE :PROCbirdie:GOTO210
  IFG  THENMODE7:PROCbad
21   G  :B(V)=B(V)+     V+1:IF V  play+1
  THENA
220PROCscr
  GOTO
240DEFPROCset  reen
   VDU  ,  ,  ,    ,6,    :GCOL  ,  :
  DRAW1 4,  PLOT85,1  4,   DRAW0,
     PLOT  ,0,  GCOL  ,  MOVE ,  :
  DRAW1  4,      ,1  4 DRAW0,
  1  4,PLOT8 ,0,700:VDU19,  ,  0;:VDU1?
  ,6,  ;
260GCOL0,
  0VDU5,27,221,1,1,1,1,1,1,1,1,  ,  5,1,
  0,0,24,24,0,0,0,  ,  26,1,0,24,61,60,
  24,0,0,  ,  27,0,  E,6 ,6 ,6  ,8,0,
280VDU2  ,  8,1,  ,4,5,16,  ,64,1  ,
  4,1 8,64,  ,16,8,4,  ,1
290MOVE1, 1 :PRINT    :MOVE1-1  ,  :
  PRINTCHR$  4:GCOL0,3:MOVE1-15,700:
  PRINTCHR$ 4 IFscr 4ANDwa-1 PROCwater
300GCOL  1:MOVE  ,  :PRINTCHR$S1?
310ENDPROC
3  DEFPROCvar
  wa=0:w =RND 1  +10 :X =110  Y%=100:
  S1 =  G=0:A$=
340ENDPROC
350DEFPROCcircle
360GCOL  :MOVEX%,Y%:PRINTCHR$S1
370FORI=1,5  10 -1 STEP-  *FI/120
380FORH=0TO1:GCOL  ,  E%=(1  R-B1+  IN
  (I+B)*F%=100+COS(I*D):IFPOINT(E%,
  F%)=4THENPROCwaterhole
390MOVEE%,F% PRINTCHR$S1%:NEXTH:  I  1,
  S1%
400IF  I  S1%=  5
410IFF  685ANDE%  400THENI=-1
420IFE   AND E   1 0ANDF  680ANDF  710
  THENG=1:I=-1
4  NEXTI
440IFG  1 THENGCOL0,1:MOVEE%,F%:PRINT
  CHR$  5:S=(E%-1)*  ,65:T=(  00-F%)
450ENDPROC
460DEFPROCholein:FORI=0TO1 PRINTCHR$145;
  CHR$1  ;CHR$1  TAB(  )CHR$141
  "Hole in 1":NEXT:ENDPROC
470G=1:E=6  +5:F=45
480IFE  1  OR   1  PRINTTAB(0,1  )
  Still on the fairway :FORT=0TO2000
  :NEXT:G=G+1:GOTO60
490DEFPROCgreen:VDU  ,  ,0,0:VDU19,
  6,0,0;:GCOL 1,2:MOVE0, :DRAW1279,0:
  PLOT85,1  ,5,  DRAW0,7  PLOT85,0,
  GCOL  ,6:MOVE0,  DRAW1   ,700:
```

```
PLOT85,1,79,1024:DRAW0,1024:PLOT85,
0,700:GCOL0,0:VDU19,2,2;0;19,6,6;0;
500MOVE600,764:PRINTCHR$228:MOVE600,
764:PRINTCHR$224:MOVE600,732:PRINT
CHR$229:MOVE600,732:PRINTCHR$224
510MOVE600,700:PRINTCHR$224:MOVE600,668
:PRINTCHR$224:GCOL0,0:MOVE625,626:
PRINT"O":GCOL0,3:MOVE600,636:PRINT
CHR$224
520GCOL0,1:MOVEE,F:PRINTCHR$226:GCOL0,3
530VDU4:VDU30:INPUT"X Length "X," Y
Length "Y:X=X/32:Y=Y/32:VDU5
540GCOL0,2:MOVEE,F:PRINTCHR$227
550TIME=0:REPEAT:GCOL0,2:MOVEE,F:PRINT
CHR$226:GCOL0,1:E=E+X:F=F+Y:MOVEE,
F:PRINTCHR$226:IFE<660 AND E>585
ANDF>620ANDF<645THENt=1
560UNTIL TIME>600ORF>680ORF<300ORE>1180
ORE<60ORt=1
570IFt=1THEN630
580IFF>680 F=670
590IFF<30 F=320
600IFE>1180 E=1170
610IFE<60 E=70
620T=GET
630G=G+1:UNTIL t=1
640GOTO190
650DEFPROCbirdie:FORT=0TO1:PRINTCHR$
145;CHR$157;CHR$131;TAB(13,T)CHR$
141"A Birdie":NEXT:ENDPROC
660DEFPROCbad:FORI=0TO1:PRINTCHR$145;
CHR$157;CHR$131;TAB(12,I)CHR$141
"Hole in ";G:NEXT:ENDPROC
670DEFPROCinstr:FORT=0TO1:PRINTCHR$145;
CHR$157;CHR$131;TAB(12,T)CHR$141
"AMATEUR GOLF":NEXT
680PRINT'"   Try your hand at this
interesting and calculating sport."
690PRINT'"  Press the SPACE BAR
whenever you need to move onto the
next exciting part of the game."
700PRINTTAB(0,23)"    (Press the SPACE
BAR to continue)":F=GET:IFF<>32
THEN700
710VDU12:FORT=0TO1:PRINTCHR$145;CHR$
157;CHR$131;TAB(13,T)CHR$141
"INSTRUCTIONS":NEXT
720PRINT"      PAR 3 Golf":PRINT'" / / /
730PRINT'"  Firstly a view of the Fairway
is shown.Your ball is in the right ha
nd bottom  corner;the hole is marked
by the flag."
740PRINT'" Then,press the SPACE BAR,and
the screenwill clear & you must enter
the length  of your shot and the
upward drive.
750PRINT" Then you are back on the
fairway. Hit RETURN and watch the
ball rise away,thenfall down"
760PRINT' If you get a Hole in One,well
done.
770PRINTTAB(0,23)"    (Press the SPACE
BAR to continue)":F=GET:IFF<>32
THEN770
780VDU12:FORI=0TO1:PRINTCHR$145;CHR$
157;CHR$131;TAB(10,T)CHR$141"
INSTRUCTIONS(cont)":NEXT
790PRINT"    If you didn't get a Hole in
One,read on
800PRINT' THE PUTTING GREEN":PRINT  //
,,//'/,,,//////'
810PRINT" There is a view of the green
with your ball on it."
820PRINT" Press the SPACE BAR and enter
the horizontal (X) and vertical (Y)
distances to the hole."
830PRINT" Your ball will travel
accordingly."
840PRINT" Remember,if your ball is to
the left ofthe hole,the number
entered must be pos itive. If it is
to the right it must be negative."
850PRINT' This is also true of vertical
movement.Up is positive, Down is
negative."
860 PRINT"    GOOD LUCK in your game
870PRINTTAB(0,23)"   (Press the SPACE
BAR to continue)":F=GET:IFF<>32
THEN870
880VDU12:INPUT"How many players (1-9)
"'play
890IFplay>9ORplay<1 THEN 880
900FORT=1TOplay:PRINT'"Player ";T;" ";
:INPUTA$(T):NEXT
910FORT=1TOplay:B(T)=10:NEXT
920ENDPROC
930DEFPROCscr
940FORT=1TOplay:IFB(T)=10B$(T)="on PAR"
950IFB(T)<10B$(T)=STR$(10-B(T))+" under
PAR"
960IFB(T)>10B$(T)=STR$(B(T)-10)+" over
PAR"
970NEXT
980PRINT"   SCORE":PRINT"   ///
990FORT=1TOplay:PRINT:FORt=1TOLEN(A$
(T)):PRINTMID$(A$(T),t,1);:FORU=1TO
160:NEXT:NEXT:PRINTTAB(15);:FORt=1
TOLEN(B$(T)):PRINTMID$(B$(T),t,1);
:FORU=1TO160:NEXT,
1000IFscr=9 THEN PRINT"    That was
the last hole of the game.":END
1010scr=scr+1:PRINTTAB(0,23)"   (Press
the SPACE BAR to re-start)":F=GET
:IFF<>32THEN1010
1020ENDPROC
1030DEFPROCtitle
1040I=0:FORI%=&7C28TO&7C4A:PRINTTAB(6):
CHR$145;CHR$154;:FORA%=7TO0STEP-1:
SOUND1,-15,I,1:SOUND2,-15,I+8,1:
SOUND3,-15,I+16,1:IF(?I% AND 2^A%)=
2^A% THENVDU255ELSEVDU32
1050I=I+1:NEXT:PRINT:NEXT:PRINTTAB
(17,6)"AMATEUR"
1060PRINT:FORI%=&7C4BTO&7C70:PRINT
TAB(9);CHR$148;CHR$154;:FORA%=7TO0
STEP-1:SOUND1,-15,I,1:SOUND2,-15,
I+8,1:SOUND3,-15,I+16,1:IF(?I% AND
2^A%)=2^A% THENVDU255ELSEVDU32
1070I=I+1:NEXT:PRINT:NEXT:PRINTTAB
(18,17)"GOLF"
1080PRINTTAB(8,20)"Taylorsoft 1983"
1090FORT=0TO5000:NEXT
1100ENDPROC
1110DEFPROCwater
1120GCOL0,4:MOVE400,500
1130FORT=0TO2*PI STEP2*PI/12
1140MOVE400,500:PLOT85,SIN(T)*100+400,
COS(T)*80+500:NEXT
1150ENDPROC
1160DEFPROCwaterhole:SOUND0,-15,10,10:
VDU20:GCOL0,2:PRINT"Waterhole drop
point":
G=G+1:ENDPROC
```

Golf
by Jonathan Taylor

Spectrum Says

on Spectrum

This program is based on the popular electronic game in which the player copies an increasingly longer sequence of notes and coloured lights.

A random number is generated in line 30 and is stored in the array which holds the sequence (a). This number is then used to make the pitch, colour and print position of the next note.

Lines 93 and 101 use the *Str$* function to convert the current element of a into a string to enable the program to check that the *Inkey$* contains the same value.

```
1 REM **SPECTRUM SAYS...**
     **© P.WALLER-JAN.83**
     *********************
2 PAPER 0  INK 7  BORDER 0  CLS
5 GO SUB 1000
10 DIM s(30)
20 FOR a=1 TO 30
25 IF a=sk+1 THEN GO SUB 6000
30 LET s(a)=INT (RND*6)+1
40 FOR n=1 TO a
45 PRINT AT 10,s(n)+12, INK s(n);"■"
50 BEEP .4,s(n)
70 FOR q=1 TO ABS (sk-50)  NEXT q
75 PRINT AT 10,s(n)+12," "
80 NEXT n
90 FOR n=1 TO a
91 FOR q=1 TO 400
92 IF INKEY$="" THEN NEXT q
93 IF INKEY$=STR$ s(n) THEN GO TO 110
101 IF INKEY$<>STR$ s(n) THEN GO TO 5000
102 NEXT q
103 GO TO 5000
110 PRINT AT 10,s(n)+12, INK s(n);"■"
120 BEEP .4,s(n)
130 PRINT AT 10,s(n)+12,"  "
140 NEXT n  PRINT AT 10,5;a
145 FOR q=1 TO 100  NEXT q
150 NEXT a
1000 PRINT AT 20,13, INK 1;"PAPER 0,1, INK 2,2, INK 3,3, INK 4,4, INK 5,5, INK 6,6
1010 FOR f=2 TO 15  FOR d=1 TO 6
1020 PRINT AT f,d+12, INK d;"■"
1030 NEXT d  NEXT f
1040 PRINT AT 10,13;"
1050 PRINT AT 8,6;"SPECTRUM SAYS..."
1060 GO TO 5070
5000 FOR j=1 TO 10
5010 BEEP .1,-10  NEXT j  BEEP 1,-30
5020 PRINT AT 21,4;"YOU GOT THROUGH ";a-1;" NOTES"
5030 FOR q=1 TO 500  NEXT q
5040 PRINT AT 21,0;"ANOTHER GAME?(y/n)"
5050 IF INKEY$="" THEN GO TO 5050
5060 IF INKEY$="n" OR INKEY$="N" THEN STOP
5070 INPUT "ENTER SKILL LEVEL(1, 2 OR 3)";sk
5080 LET sk=sk*10
5090 PRINT AT 21,0;"YOU MUST FOLLOW ";sk;" NOTES"
5100 PAUSE 200
5110 PRINT AT 21,0; FLASH 1;"  PRESS ANY KEY TO PLAY"
5120 PAUSE 0
5130 PRINT AT 21,0;"
5140 PRINT AT 18,5;"
5150 GO TO 10
6000 PRINT AT 21,0, INK 6, BRIGHT 1, FLASH 1;"SPECTRUM SAYS... WELL DONE"
6010 FOR q=10 TO 30
6020 BEEP .1,q
6030 NEXT q
6040 PAUSE 500  GO TO 5070
```

Spectrum Says
by P Waller

Hello Universe

on Vic20

The program simulates American proposed attempts at making contact with other planets through transmitted radio messages.

It uses data to create a 22 × 23 picture on the screen. The Vic20 sound facility creates the signal sound as the picture is slowly built up on the screen.

Presumably those with the 40/80 column add on can use the data lines to create quite detailed pictures.

```
10 REM NASA DATA SIMULATION
20 REM RICHARD BARTON
30 PRINT"□"
40 S=36876 CO=30720
50 POKE36878,5
60 FORP=7680TO8185
70 READA
90 IFA=1THENX=160 POKES,240
100 IFA=0THENX=32 POKES,130
110 POKEP,X POKEP+CO,0
120 NEXTP
125 GOTO500
130 DATA0,1,0,1,1,0,1,1,1,0,1,1,1,1,0,1,1,1,1,1,1,0,1
140 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1
150 DATA0,0,1,1,1,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,1
160 DATA0,0,1,1,1,0,0,0,0,0,0,1,1,1,1,1,1,1,1,1,0,0,1
170 DATA0,0,0,1,0,0,0,0,0,0,0,0,1,1,1,1,1,1,1,0,0,0,1
180 DATA0,1,1,1,1,1,0,0,0,0,0,0,1,0,1,1,0,1,0,0,0,0,1
190 DATA0,1,1,1,1,1,0,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0
200 DATA1,0,1,1,1,0,1,0,0,0,0,0,1,1,0,0,1,1,0,0,0,0,1
210 DATA1,0,1,1,1,0,1,0,1,1,1,0,0,0,1,1,0,0,0,0,0,0,1
220 DATA1,0,1,1,1,0,1,0,1,1,1,0,0,0,1,1,0,0,0,0,0,0,1
230 DATA0,0,1,1,1,0,1,0,0,1,0,0,0,1,1,1,1,1,0,0,0,0,1
240 DATA0,0,1,0,1,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,1
250 DATA0,0,1,0,1,0,0,0,1,1,1,0,1,0,0,0,0,0,0,0,0,0,1
260 DATA0,1,1,0,1,1,0,0,1,0,1,0,0,0,0,0,0,0,0,0,0,0,1
270 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
280 DATA0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,1
290 DATA0,0,1,1,1,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,1
300 DATA0,1,1,1,1,1,0,1,0,1,0,1,0,1,0,0,0,0,0,0,0,0,1
310 DATA0,0,1,1,1,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,1
320 DATA0,0,0,1,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,1
330 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1
340 DATA0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1
350 DATA1,1,1,1,1,1,1,1,1,1,0,1,1,1,1,1,1,1,1,1,1,0,1
500 POKES,0
510 GETA$ IFA$=""THEN510
520 RUN
```

Hello Universe
by Richard Barton

Demon Invaders

on Spectrum

This program is a typical earth defence game using 10 user defined graphics. It contains full instructions and should easily fit into the 16K machine.

The screen shows the view through the cockpit of a space ship. Using the normal cursor keys you must move the sights and fire using 0.

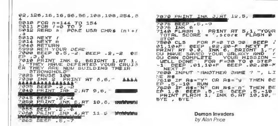
The game uses the variable *man* to detect how many aliens have landed and *kil* to detect how many aliens you have destroyed.

Variable *Score* keeps a record of this. The Stars are plotted randomly and the aliens are positioned by random movement.

The game ends when eight aliens have landed; conversely if you manage to shoot down eight you have won.

```
   3 GO SUB 5000
   4 GO SUB 4000
   5 LET l=16  LET k=11  LET pos
=10
   6 LET m=3  LET kil=0  LET n=I
NT (RND*26)+2
   8 LET score=0
   9 LET MAN=0
  50 INK 5  BRIGHT 1  CIRCLE 35,
35,10  CIRCLE 50,35,10
  51 PLOT 50,35  DRAW 8,0  PLOT
35,35  DRAW 0,8
  53 FOR b=16 TO 18  PRINT INK 6
 BRIGHT 1,AT b,10, [redacted]  NEX
T b  PRINT PAPER 6, BRIGHT 1, IN
K 0,AT 17,11, "*=100"
  54 PRINT INK 5, BRIGHT 1,AT 16
,17,"0  0  0"
  55 PRINT INK 5, BRIGHT 1 AT 18
,17,"▪▪▪▪"
  56 PRINT INK 4, BRIGHT 1,AT 17
 17,"▪▪"  PRINT INK 3, BRIGHT 1
AT 17,19,"▪▪"
  58 PRINT INK 6  BRIGHT 1, FLAS
H 1,AT 16,26,"▪"  PRINT INK 1  B
RIGHT 1, FLASH 1,AT 16,28,"▪", I
NK 2,AT 16,30,"▪"
  59 PRINT INK 3, BRIGHT 1, FLAS
H 1,,AT 18,26,"▪"  PRINT INK 5,
BRIGHT 1, FLASH 1,AT 18,28,"▪",
INK 7, BRIGHT 1,AT 18 30,"▪"
  70 INK 5  BRIGHT 1  PLOT 0,50
 DRAW 255,0
  71 INK 5  BRIGHT 1  PLOT 200,1
4  DRAW 0,35
  80 INK 2  PLOT 0,15  DRAW 255
0
 120 INK 7  BRIGHT 1  PLOT 0,0
DRAW 0,175  DRAW 255,0  DRAW 0,-
175  DRAW -255,0
 125 PRINT AT k,l-1," "
 126 PRINT AT k,l+1," "
 127 PRINT AT k-1,l," "
 128 PRINT AT k+1,l," "
 130 IF INKEY$="8" AND l<29 THEN
 LET l=l+1
 140 IF INKEY$="5" AND l>2 THEN
LET l=l-1
 150 IF INKEY$="6" AND k<13 THEN
 LET k=k+1
 160 IF INKEY$="7" AND k>2 THEN
LET k=k-1
 180 PRINT AT INT m,INT n," "
 200 PRINT AT k,l-1,"-"
 210 PRINT AT k-1,l,"|"
 220 PRINT AT k+1,l,"|"
 230 PRINT AT k,l+1,"-"
 240 IF INKEY$="0" THEN FOR f=0
TO 10  BEEP .005,1+f  NEXT f  IF
 k=INT m AND l=INT n THEN GO SUB
 1000
 245 LET n=n+INT (RND*3)-1
 246 IF n<3 THEN LET n=n+1
 247 IF n>29 THEN LET n=n-1
 248 BEEP .01,10
 250 LET m=m+0.2
 252 IF score>1000 THEN LET m=m+
0.2  IF m>2000 THEN LET m=m+0.2
 255 IF n<1 OR n>31 THEN PLOT 0,
0  DRAW 0,175  DRAW 255,0  DRAW
0,-175  DRAW -255,0
 260 IF m>15 THEN GO SUB 2000
 300 INK 4  PRINT AT INT m,INT n
,"*"  INK 7
 310 PRINT AT 1,1,"SCORE = ",sco
re," "
 999 GO TO 125
1020 PRINT AT k,l,"*"  PRINT , O
VER 1,AT k,l,"▪"
1030 FOR f=1 TO 12  BEEP .1,20+f
  BEEP .1,-4  NEXT f
1040 PRINT AT k,l," "
1050 LET m=3  LET n=INT (RND*26)
+2
1060 LET score=score+200  LET ki
l=kil+1
1070 IF kil=8 THEN GO TO 7500
1080 RETURN
2000 LET man=man+1
2010 IF man>8 THEN GO TO 7000
2015 LET m=3  LET n=INT (RND*26)
+2
2020 RETURN
3005 FOR n=1 TO 30  BEEP .05,20
 BEEP .05,0  NEXT n
4000 PAPER 0  INK 5  BRIGHT 1  B
ORDER 0  CLS
4010 PRINT AT 0,5,"** DEMON INVA
DERS **"
4015 PRINT INK 2, BRIGHT 1,AT 1,
5,"______________________"
4020 INK 5  BRIGHT 1  PRINT  PR
INT "You are in the gunning pod
on a secret mission,you are aboa
rd a rebel cruiser and just as y
ou    enter your galaxy you are
      attacked by DEMON INVADERS"
4030 INK 5  BRIGHT 1  PRINT  PR
INT  PRINT "  5 = LEFT"  PRINT
 PRINT "  8 = RIGHT"  PRINT  P
RINT "  6 = DOWN"  PRINT  PRINT
"  7 = UP"  PRINT  PRINT "  0
 - FIRE"
4035 PRINT INK 2, BRIGHT 1,AT 8,
0,"* * * * * * * * * * * * * * *
 *"
4040 PRINT INK 6, BRIGHT 1,AT 21
,1,"HOPE YOU GET A GOOD SCORE"
PRINT INK 6, BRIGHT 1,AT 20,1, F
LASH 1,"PRESS ANY KEY TO START"
 FLASH 0
4041 INK 4  BRIGHT 1  PLOT 115,5
0  DRAW 70,0  DRAW -10,10  PLOT
115,50  DRAW 10,10  PLOT 125,60
 DRAW 50,0
4042 INK 4  BRIGHT 1  PLOT 130,6
0  DRAW 10,10  PLOT 170,60  DRAW
 -10,10  PLOT 138,70  DRAW 24,0
4043 INK 4  BRIGHT 1  PLOT 120,3
0  DRAW 10,20  PLOT 180,30  DRAW
 -10,20
4045 PAUSE 9999
4049 REM STARS
4050 BORDER 0  PAPER 0  INK 6  C
LS  FOR n=0 TO 50  BEEP 0.005,4
0+2  BEEP .005,20  INK 7  BRIGHT
 1  PLOT INT (RND*250)+5,INT (RN
D*120)+50  NEXT n  INK 4  GO TO
5
5000 REM USER DEFINED GRAPHICS
5001 DATA 0,24,126,255,24,36,0,0
5003 DATA BIN 11111111,BIN 11111
111,BIN 11000000,BIN 11111111,BI
N 00000011,BIN 00000011,BIN 1111
1111,BIN 11111111
5004 DATA BIN 01111111,BIN 01111
111,BIN 01100000,BIN 01100000,BI
N 01100000,BIN 01100000,BIN 0111
1111,BIN 01111111
5005 DATA BIN 01111111,BIN 01111
111,BIN 01100011,BIN 01100011,BI
N 01100011,BIN 01100011,BIN 0111
1111,BIN 01111111
5006 DATA BIN 01111111,BIN 01100
001,BIN 01100001,BIN 01111111,BI
N 01111000,BIN 01101000,BIN 0110
0100,BIN 01100011
5007 DATA BIN 01111111,BIN 01100
000,BIN 01100000,BIN 01111100,BI
N 01111100,BIN 01100000,BIN 0110
0000,BIN 11111111
5008 DATA BIN 10010101,BIN 00001
001,BIN 10100100,BIN 01001010,BI
N 10000101,BIN 10000111,BIN 1001
0010,BIN 10010101
5009 DATA 195,219,255,102,126,12
6,66,107,195,219,255,102,126,126
,106,214,0,219,219,255,231,126,1
```

OPEN FORUM



```
02,128,16,16,56,56,108,108,254,8
4
5010 FOR n=144 TO 154
5011 FOR f=0 TO 7
5012 READ a  POKE USR CHR$ (n)+f
,a
5013 NEXT f
5014 NEXT n
5040 RETURN
6999 REM YOUR DEAD
7000 BEEP 0.5,-2  BEEP .2,-2  BE
EP .3,0
7010 PRINT INK 6, BRIGHT 1,AT 1,
1,"THEY HAVE DEFERTED YOUR CRUIS
ER THEY ARE NOW BUILDING THEIR
   STRONGHOLD"
7025 PAUSE 100
7030 INK 2  PRINT AT 8,6,"  ▲▲▲▲
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲"
7035 BEEP .2,-2
7040 PRINT INK 2,AT 9,6,"[redacted]
7045 BEEP ,2,-4
7050 PRINT INK 6,AT 10,6, [redacted]
7055 BEEP .2,-6
7060 PRINT INK 4,AT 11 6 [redacted]
7065 BEEP .5,-7
7070 PRINT INK 3,AT 12,5, [redacted]
7075 BEEP ,5,-9
7076 INK 6
7140 FLASH 1  PRINT AT 5,1,"YOUR
 TOTAL SCORE = ",score  FLASH 0
 STOP
7500 CLS   FOR F=0 TO 30  BEEP .
01,10+F  BEEP .02,20-F  NEXT F
PRINT AT 0,0, INK 6, BRIGHT 1,"Y
OU HAVE SAVED YOUR GALAXY AND  Y
OU CAN COMPLETE   YOUR MISSION -
 WELL DONE"  FOR F=30 TO 0 STEP
-1  BEEP .01,10+F  BEEP .02,20-F
  NEXT F
7600 INPUT "ANOTHER GAME ? ", LI
NE R$
7610 IF A$="Y" OR A$="y" THEN BE
EP .5,-10  RUN
7620 IF A$="N" OR A$="n" THEN BE
EP 1,0  BEEP .5,-5  BEEP .5,-10
 PRINT FLASH 1, INK 6,AT 10,10,"
BYE , BYE"
```

Demon Invaders
by Alan Price

Calendar

on Aquarius

This program has been designed to work on the ZX81 Spectrum or the unexpanded Aquarius. It is fully error trapped and takes into account leap years in its calculations

```
10 REM CALENDER FOR THE
   UNEXPANDED AQUARIUS
20 REM WRITTEN BY H.J.Dyos
25 PRINT CHR$ (11)
30 PRINT TAB (15),"CALENDER"
40 PRINT TAB (15),"========"
45 LET S$="    ****************
   *************"
 50 INPUT "ENTER YEAR? ",Y
 60 REM >>>check that year has
been typed in correctly<<<
 70 IF Y<>INT (Y) THEN GO TO 50
 80 IF Y<1 THEN GO TO 50
 90 IF Y>5000 THEN GO TO 50
100 REM >>>find first of Jan<<<
110 LET Y1 =INT ((Y-1)/100)
120 LET Y2=Y-1-100*Y1
130 LET D=799+Y2+INT (Y2/4)+INT
(Y1/4)-2*Y1
140 LET D=-(D-(INT (D/7)*7))
150 PRINT CHR$ (11)
160 PRINT TAB (15),Y
170 PRINT TAB (16),"===="
180 PRINT
190 LET L=0
200 REM >>check for leap year<<
210 IF ((INT (Y/4)*4)<>Y) THEN
    GO TO 250
220 IF ((INT (Y/400)*400)=Y) TH
    EN GO TO 240
230 IF ((INT (Y/100)*100)=Y) TH
    EN GO TO 250
240 LET L=1
250 DIM A$(12)  DIM M(12)
270 FOR N=1 TO 12
280 READ A$(N),M(N)
 300 PRINT "     **********  ,A$(N
),"********"
 310 PRINT "     SUN MON TUE WED
THU FRI SAT"
 320 PRINT S$
 330 IF N<>2 THEN GO TO 350
 340 LET M(2)=M(2)+L
 350 FOR I=1 TO 6
 360 PRINT
 370 FOR J=1 TO 7
 380 LET D=D+1
 390 IF D>M(N) THEN GO TO 470
 400 IF D<=0 THEN GO TO 430
 410 PRINT TAB (J*4),D,
 430 NEXT J
 440 LET J=1
 450 IF D=M(N) THEN GO TO 470
 460 NEXT I
 470 LET D=1-J
 480 IF INKEY$="" THEN GO TO 463
 490 PRINT  PRINT  PAINT
 500 NEXT N
1000 DATA "JANUARY**",31,"FEBRUA
RY**",28,"MARCH****",31,"APRIL**
**",30
1010 DATA "MAY******",31,"JUNE**
***",30,"JULY*****",31,"AUGUST**
*",31
1020 DATA "SEPTEMBER",30,"OCTOBE
R**",31,"NOVEMBER*",30,"DECEMBER
*",31
```

Calendar
by M J Dyos

Space Attack

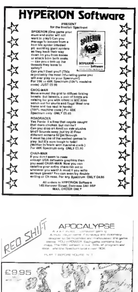
on BBC Micro

This program exhibits the BBC's colour and graphic facilities well. The object of the game is to destroy as many of the nasty aliens as possible whilst avoiding the hazards. Full instructions are included in the program.

Program notes

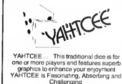
10-60	Instructions, defining characters and variables
90-190	Main loop
190-220	End game
230-260	Move surface
270-460	Control players craft
470	Convert *Tab* x co-ords to *Move* co-ords
480	Convert *Tab* y co-ords to *Move* co-ords
490-630	Control alien craft
650-710	Explosion routine
720-790	Gas cloud hazard routine
800-860	Space mine hazard routine
672-1040	Defining characters and variables
1050-1170	Instructions

```
10 REM ***************
20 REM * SPACE ATTACK *
30 REM * R.Yeardley   *
40 REM ***************
50 MODE7:DIMC$(1)
60 PROCintro:PROCchrs
70 ON ERROR GOTO 190
80 MODE1:PROCscr
90 REPEAT
100 IFRND(100)<8 ANDM=0 M=1
110 PROCbase
120 PROCship
130 PLOT67,RND(1280),RND(1024)
140 PROCalien
150 PROCcloud
160 IFM=1 PROCmine
170 PRINTCHR$30;SH'TAB(27,0);SC;"00"
180 UNTILSH<=0
190 MODE7:PRINT''':*FX15,0
200 PRINT"You have scored ";SC;"00
    points"
210 PRINT"Another go?":REPEATC$=GET$
    :UNTILC$="Y"ORC$="N":IFC$="Y"
    GOTO80
220 END
230 DEFPROCbase:COLOUR2
240 PRINTTAB(1,30);LEFT$(B$,38)
250 B$=RIGHT$(B$,LEN(B$)-1)+LEFT$(B$,1)
260 ENDPROC
270 DEFPROCship
280 COLOUR1:PRINTTAB(1,Y);"  "
290 Y=Y+(INKEY(-58)ANDY>1)-(INKEY(-42))
300 IFY>=30 GOSUB340
310 PRINTTAB(1,Y);CHR$252;CHR$251
320 IFINKEY(-97) GOSUB370
330 ENDPROC
340 PROCcrash(1,Y)
350 SH=SH-1:IFSH<=0 ENDPROC
360 PROCscr:Y=10:RETURN
370 F=400:IFY=W THENF=(FNx(Q,0)-FNx(1,
    64))+25:IFF>400 F=400
380 SOUND&11,1,50,3
390 MOVEFNx(1,64),FNy(Y)-4:GCOL0,1:
    DRAWFNx(1,64)+F,FNy(Y)-4:G=0
400 FORA=1TOF STEP25
410 IFPOINT(FNx(1,64)+A,FNy(Y))>0 G=
    POINT(FNx(1,64)+A,FNy(Y)):A=401
420 NEXTA
430 MOVEFNx(1,64),FNy(Y)-4:GCOL0,0:
    DRAWFNx(1,64)+F,FNy(Y)-4
440 IFG=2 PROCcrash(Q,W):PROCscr:PROC
    init:SC=SC+2
450 IFY=P AND(O<16 ANDRND>.5) H=0:
    PRINTTAB(0,P)" ":SOUND0,-12,4,1:O=
    40:P=RND(2):SC=SC+1
460 RETURN
470 DEFFNx(F,E)=F*32+E
480 DEFFNy(F)=INT(1023*((31-F)/32)+20)
490 DEFPROCalien
500 COLOUR2:PRINTTAB(Q,W)"  "
510 Q=Q-1:W=W-(RND>.5 ANDW<=1)+(RND<0.5)
    IFW>=30 GOTO570
520 PRINTTAB(Q,W);CHR$250;CHR$249
530 IFQ=1 ANDW=Y GOTO570
540 IFQ=1 PROCinit:ENDPROC
550 IF(RND(37)=Q OR RND(50)>45) SOUND&1
    2,1,10,3:GOSUB580
560 ENDPROC
570 PROCcrash(Q,W):SH=0:ENDPROC
580 FORG=1 TO0 STEP-1
590 MOVEFNx(Q,0),FNy(W):GCOL0,G
600 MOVEFNx(1,0),FNy(W)+15:PLOT85,FNx(1
    0),FNy(W)-15
610 NEXTG
620 IFW=Y GOSUB340
630 RETURN
640 DEFPROCinit:PRINTTAB(1,W)"  ":Q=30:
    W=RND(20):ENDPROC
650 DEFPROCcrash(A,B)
660 SOUND0,-12,100,20
670 VDU19,3,15,0,0,0:GCOL0,3
680 FORG=1TO20:MOVEFNx(A,10),FNy(B):
    DRAWFNx(A,10)+RND(100)-50,FNy(B)+
    RND(100)-0:NEXTG
690 FORG=1TO1000:NEXTG
700 VDU19,3,7,0,0,0
710 ENDPROC
720 DEFPROCcloud
730 COLOUR3:VDU19,3,2,0,0,0
740 PRINTTAB(L,K);C$(0)
750 L=L-1:K=K-(RND>.5 ANDK<20)+(RND<.5
    ANDK>2)
760 IFL=0 L=38:K=Y:ENDPROC
770 PRINTTAB(L,K);C$(1)
780 IFL=1 AND(Y=K ORY=K+1)THENGOSUB340
790 ENDPROC
800 DEFPROCmine:SOUND2,-12,234,1,
810 COLOUR1:PRINTTAB(0,P)" "
820 O=O-RND(2):P=P-(Y>P)+(Y<P):IFP>=30
    ORP<1 M=0
830 IFO<=0 O=40:M=0:ENDPROC
840 PRINTTAB(O,P);CHR$253
850 IF(O=2 ORO=1)ANDY=P SH=0:GOSUB340
860 ENDPROC
870 DEFPROCchrs
880 ENVELOPE1,1,100,0,-3,15,1,50,126,-1
    ,0,-5,126,126
890 C$(0)="  "+CHR$8+CHR$8+CHR$10+"  ":
    C$(1)=CHR$248+CHR$247+CHR$8+CHR$8+
    CHR$1+CHR$246+CHR$245
900 Y=10:W=10:PROCinit:C=0:M=0:L=29:K=
    10:O=40:P=12:SH=3:SC=0
910 B$=STRING$(20,CHR$255+CHR$254)
```









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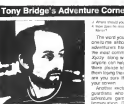
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ENCLOSED TOTAL SUM

```
920 VDU19,2,5,0,0,0
930 VDU23,255,0,48,76,131,0,0,0,0
940 VDU23,254,0,0,0,195,70,48,0,0
950 VDU23,253,0,90,60,126,126,60,90,0
960 VDU23,252,0,24,124,126,127,127,127,
    0
970 VDU23,251,0,0,0,60,255,255,254,192
980 VDU23,250,0,0,14,127,63,63,7,7
990 VDU23,249,0,112,248,252,254,254,128
    ,0
1000 VDU23,248,0,3,20,8,112,65,130,132
1010 VDU23,247,252,132,20,4,192,34,33,
     65
1020 VDU23,246,132,196,32,16,16,16,8,7
1030 VDU23,245,129,61,117,123,1,30,16,
     220
1040 ENDPROC
1050 DEFPROCscr CLS:COLOUR1
1060 PRINTTAB(5,0)"Lives"TAB(20,0)"Score
1070 VDU23,1,0;0;0;0;
1080 FORF=1TO100:PLOT69,RND(1280),RND(10
     24)
1090 GCOL0,RND(3):NEXTF:ENDPROC
1100 DEFPROCintro
1110 PRINT'''"You must defend your
     asteriod from the  invading space
     pirates."
1120 PRINT"Suroudiing the asteriod are
     gas clouds   which will deplete
     your shieds if you  fly into one."
1130 PRINT"The space pirates also drop
     homing minessome of them can be
     shot dow but if onehits you it will
     destroy your ship."
1140 PRINT"The pirates also fire at you;
     your ship  can survive three hits
     by ther cannon."
1150 PRINT'''"Use the up and down '
     cursor'keys to moveand the TAB key
     to fire."
1160 PRINT''"Press 'S' to start.":REPEAT
     UNTILGET$="S"
1170 ENDPROC
```

Space Attack
by R Yeardly

Tony Bridge's Adventure Corner



Mainframe mania explained

Derek Cox from Coventry is another midnight adventurer but he has a lot of trouble finding the adventure program on the firm's twin IBM 4341s — the dreaded system programmers have put a hex on the machines and they refuse to give up their secrets! Derek has been reduced to writing his own adventure program which sounds quite an achievement as the computers run the language *Exec* (maybe Ziggurat would give us the benefit of his erudition and show us exactly how difficult that might be)

I spoke earlier of the adventurer's craving for more and more memory — Derek reckons that he has over 4000K to play with!

You mention *Star Trek* Derek — yes it is a good game and there are many versions of it available for your home micro which is a Spectrum Silversoft has what must be a pretty good version figuring as it does in many of the weekly software charts

Virgin Games has also released a version called *Starfire* which is not bad at all But I hope that by now you will have obtained that copy of *The Hobbit* and found out at first hand what all the fuss is about! I hope though that it won't put you off writing in *Exec!*

I have noticed however that adventure programs on mainframes are becoming a threat to national security! Shaun Kneller is huddled beside a Harrier somewhere in the wastes of Aberdeenshire — is he guarding the nation from the hordes from the steppes? No you guessed it he along with the other lads of RAF Buchan are becoming Master Class C Adventurers! He has a few questions that someone may be able to help him with

1 Where is the float?
2 ditto The Shovel?
3 Where should you say the word GHAZH?
4 How does he reach and what does he do with The Mirror?

When working slowly through an adventure making a map is essential! Mark on the local one all the exits along with all the objects you have found there or dropped there in your wanderings

Sometimes the map may take on a significance of its own — there is a very well-known and respected adventure for the Spectrum for example where the map, if the adventurer has drawn one up becomes a pattern which has a great importance Does anyone know which one it is?

The word you mention Shaun is a new one to me although most of the mainframe adventurers have a code word or two — the most common ones being *Plugh* and *Xyzzy* along with *Sesame* and *Plover* If anyone can help Shaun and his mates up there please let me know I wouldn't want them losing their sleep — hang on Shaun are you sure that's a *Space Invader* on your screen

Another sector of the nation's security guardians who have taken a liking to adventure games is the Customs and Immigration Department Officer Vic Matthews spills the beans in a letter to me Actually it is a hilarious account of a conversation between two Customs men and I wish that I could print it in its entirety

Unfortunately some high level string-pulling and words in ears contrived to get their mainframe dismantled and they have thus found themselves adventureless! Vic says that one day it may come back so asks for any tips or hints from some one from the Master Class — what about it Shaun from Aberdeenshire?

Here's Vic talking to his fellow adventurer and Customs man over the phone I really thought that I was going well I realised that once I had got the next lot of treasures out I was going to run out of power so I kept going back to that maze of twisted little passages until I found the way out! It was nice of the machine to replace my batteries for me once they ran out!

What have I found? Well I smashed the vase a couple of times until I realised that the pillow had to be dropped first and it took me a while to find a nearer source of water than the building to fill the bottle and water that beanstalk a couple of times

I found some water at the bottom of the pit Which pit? You know — the one east of the dirty passage and the dusty rocks above that complex junction What? Near the low north south passage which is south of the Y2 rock — yes that's the one

Anyway I watered the plant twice and found the eggs and the trident I soon sussed that the trident opened the clam or should I say the oyster and had to look around a bit for the contents What I want to know is how do I get any more? Try north from Bedquilt?

We'll have more from the smuggler's friend in a later week!

Jon Bentsson has written from Iceland (my stamp collection is definitely getting better lately) he is currently playing an adventure on the Apple from Rainbow which sounds very much like the original *Colossal Cave* I can't tell you more about the plover room Jon but you should find that you won't need your lamp in this room as it should be lit all the time And all the objects you mention will indeed have a use at some stage in the game — even the bear (isn't it wearing something around its neck?)

Bernard Stafford from the Wirral writes to recommend as an implementation of the original mainframe program Abersoft's adventure He wonders if there are any text adventures available for the Vic20 apart from the Scott Adams series which tends to be a bit expensive

Unfortunately Bernard this series is about the only subject that people write to me about concerning the Vic Some time ago Mrs Hildick-Smith wrote to me to ask the same question While praising the Scott Adams programs she asked me to warn people against the adventures from Rabbit Software — although she found *Moon Base Alpha* quite good and difficult to solve

Peter Clayton who also owns a Vic complained of the Pixel *Trader* program which is advertised by Quicksilva as an epic 48K graphic adventure Peter says "I have already wasted £14.95 on the *Trader* game with which I was very disappointed Although the graphics were good after a few plays it became so repetitive that the game was slung into the bottom drawer

I remember my experiences with *Trader* when it was first released for the ZX81 — the graphics for that time were indeed rather good They were let down by the game which turned out to be a series of brain twisters that, as Peter rightly pointed out, become merely boring after a couple of plays

So please let us all out of our misery — if you've played a good adventure on your Vic let everybody know — write a mini review and send it along to The Grand Wizard (oh all right — Me!)

Once again I've run out of space We'll have another dip into the world of adventure again next week ■

This series of articles is designed for novice and experienced Adventurers alike Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter So if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge, Adventure Corner, *Popular Computing Weekly* 12-13 Little Newport Street London WC2R 3LD



MUSIC PROGRAM

Adrian Shephard of Bramwell Bloxham Banbury Oxfordshire writes

Q **I came across the music program for the BBC in *PCW*, 21 October, 1982, and I decided to convert it to my Vic20. After battling with little pieces of paper I gave up. Please could you tell me what the *Instr* command does and how can I convert it to my Vic. Also, what does *Proc* mean?**

A You will need to replace this BBC instruction with a complete subroutine — *In string*. It has the effect of looking for one string within another.

So if you were looking for *A$* within *B$*, you would have to do it by setting up a loop to read the string *B$* until you came to the first character of *A$*. You would then have to read *B$* from that point and compare it with *A$*.

Proc and *Endproc* stand for *Procedure* and *Endprocedure*. It is essentially a subroutine that is called by name rather than by line number. On the Vic you could replace it with *Gosub/Return*.

AQUARIUS SUPPORT

P Harrison of Wigmore Close Bury St Edmunds writes

Q **Like many people who are thinking of buying a computer, I find the choice bewildering. I have borrowed a friend's *ZX81* so I am not quite a complete novice.**

I am considering a Spectrum, but one new computer that has caught my eye is the new Mattel Aquarius which has just been launched. I know that the basic model is cheaper than the Spectrum, but then it has less Ram. Importantly, I am worried that if I order one I will have to wait months, when I can go into Smiths and buy a Spectrum directly. How well supported do you think the Aquarius will be, what sort of back-up will it have and what sort of costs are involved?

A The Aquarius as you buy it has 4K Ram and 8K Rom, so it is less than the Spectrum in both Rom and Ram. An extended microsoft Basic cartridge is planned for release later. As far as programming goes, a lot will depend on how quickly this becomes available and on what commands are added (or are missing from the in-built Basic).

There is a Rom slot on the computer itself, however as there is only about 2K of user Ram available, I think people will quickly have to look at the prospect of buying the mini expander, which will give you three channel sound, two joystick port, a Rom and a Ram slot.

For further information, see our review in *PCW*, 11-17 August.

SOUNDED OUT

T Webb of Worcester Road, Hereford Worcester writes

Q **I have just seen your answer about the Atari and how it has quite good sound. I want to get a Commodore 80 and would like to know if its sound is as good as the Atari's.**

A The sound on the Commodore has one less channel or voice than the Atari, but each voice has up to five parameters that are accessed by *Poke* commands. It is one of the very best on the market though it is correspondingly more complex to use.

The order to set up a sound is as follows — volume: this can be any value from 0 to 15. If you *Poke* higher numbers then you can couple these with special filters, high pass, low pass and band pass. Attack/Decay: this is controlled by splitting the value *Poked* into two halves. The first four bits control the attack and the second four bits control the decay.

Waveform: this can also be controlled on the 64, and you have the choice of triangle, sawtooth, pulse and noise. Finally, there is a double *Poke* to define high and low frequency. These numbers in conjunction will give you a range of nearly seven octaves.

SPECTRUM QUESTIONS

Yee Kee Len of Block 215 Marsiling Lane, 13-810 Singapore 2573 writes

Q **I came across *Popular Computing Weekly* recently in a local bookshop and since then have been an avid reader. In this part of the world we are relatively new to the world of computers, but I have decided to invest in a Sinclair 48K Spectrum. Here are some questions that I would like to ask:**

(a) My local distributor has told me that he can upgrade the memory from 48K to 80K maximum. Will this affect the performance of my Spectrum?

(b) From your magazine I gather that there are magazines that deal mainly with the Sinclair computers. Is it possible to introduce them to me?

(c) Within the 48K Spectrum range, would you recommend any other brand? This is not prejudice, just a customer wanting to get the best value for his money.

(d) Could you send me a list of the issues that deal with the time when the Spectrum was released?

I would also like to hear from any manufacturers, who would be able to provide me with 'computer food', as there is a growing need out here for all sorts of computer back-up.

A I have included this because I am getting more and more letters from abroad. It is interesting to imagine a world devoid of ZX micro fairs, no Earls Court or Barbican shows, and where bookstalls carrying a dozen or more computer magazines are unknown.

To deal with the questions in order — you should check that your dealer will give you a guarantee to cover the upgrade because it will void the one that comes from Sinclair. Also, for your own use, find out what sort of size memory blocks the memory is switched in, and look at what this might mean to the sorts of programs you want to write. If your programs are too big, you might find that you end up switching part of the program out as you switch blocks. 80K is very useful for fairly short programs that use a lot of stored data.

As for dedicated literature, I would suggest that you contact ECC who publish *Sinclair User* at 30-31 Islington Green, London N1 8BJ.

I never recommend a specific computer, but I have a couple of words of advice. In your particular case I would suggest that you make your first priority back-up. Select a computer that has reliable local dealership.

The Spectrum, St George and *Popular Computing Weekly* all share the same birthday. We first reviewed the Spectrum in *PCW* Vol 1 No 3.

ECONOMIC SHARP

H Morris of Poole, Dorset asks

Q **I have a Sharp MZ80K which I bought secondhand. I am quite happy with it, and quite a lot of software was included when I bought it. I need a program to help me with an economics postal course I am doing. I am sure that I have seen an economics program for my computer but cannot find any mention of it now.**

A I'm not sure exactly what kind of program you need for your course. The best advice I can give is for you to contact Graham Knight, 108 Rosemount Place, Aberdeen AB2 4YW, who has a number of financial-type programs available.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, 12-13 Little Newport Street, London WC2R 3LD.


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ATARI 400/32K LE STICK 2048er Defender, Zaxxon, Shamus II, Frogger, Pharaoh's Curse and others, books, magazines. £200. Tel 089283 4240

21K VIC20 C2N CASSETTE UNIT joystick, books, plenty of magazines and software. Under guarantee, worth £300, sell for £200. Tel (0924) 253285 Andrew

VIC20 + C2N + 16K + Machine monitor + Avenger cartridge + games cassettes + wooden carrying case. Cost £350, sell for £130. Tel 01 399 2669

VIC20 + cassette deck, joystick, 3K super expander software £130. Torch expansion unit + PSU, Programmers Aid + 26K software £130. The lot £240. Tel Downland 53376 (Surrey)

ATOM 12K, FP Rom, 5V 3A regulated supply, tape recorder, carrying case, manual, oddments, tapes. £100 ono. Phone Ipswich (0473) 55754

FOR SALE. Road User and Know Your Own I Q for the Vic — 8 or 16K required. Tel 01 560 1934

DRAGON 32 3 months old with boxes, lots of software and books, two joysticks, one cartridge. £170. Tel Gravesend 64608

DRAGON MANUALS books, PSU one month old £40. Software 100+ listings, 80+ magazines including Dragon User. Hi res utilities cartridge, cassette recorder, 20in black and white television, blank cassettes. £210 or offers. 0908 518840

16K SPECTRUM very good condition, plenty of software, magazines, books. £260 ono. Tel Munday 0293 3211

DRAGON cassette recorder, much software, £9 of books, Dragon User subscription, swap for Commodore 64 or £185. Amersham (02403) 5704

ATARI VCS 12 super cartridges including Frogger, Missile CM, etc. Worth £380, price? Just £180. J Hibbit, 51 Homlea Street, London W6. Tel 937 3057

16K ZX81 good condition, loads software, free tv game and magazines. £80 ono. J Dunstan, 17 Wye Cres, Chepstow, Gwent NP6 5DW

ATOM 12K+12K Floating Point, PSU, Software. £85 ono. Tel 0604 720 374 evenings

WANTED

UNBEATABLE 33 per cent royalties for quality Spectrum software. Send tape for immediate evaluation to Odyssey Computing, 28 Bingham Road, Sherwood, Nottingham

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a growing publisher seeks titles to add to its highly regarded and successful book range. Experienced and first time authors are invited to submit manuscripts, ideas or fields of interest. For details of what we can offer, write to **David Lawrence, Book Editor, Sunshine, 12-13 Little Newport Street, London WC2R 3LD**

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WANTED Spectrum light pen in working order, with accompanying program. Tel 0964 534518

HOME MANAGEMENT

★ FOR ZX SPECTRUM 48K ★

PAGEPRO SYSTEM — an easy method of storing/printing pages of information with multiple uses including letters, lists, menus, etc. The program has a user facility and outputs to screen or ZX printer. Send cheque PO for £5.95 to **SD MICRO SYSTEMS, PO Box 24, Hitchin, Herts SG4 0AE**. SAE for list of software range

HARDWARE

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(0532) 667183

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COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send it to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-734 3454

All software offered through computer swap must be in original condition and for private sale only

Warning: It is illegal to advertise pirated software

COMPUTER SWAP

Please write your copy in capital letters on the lines below

Name ....

Address ....

....

Telephone ....



PROGRAMMERS

EXCHANGE

SWAP BBC SOFTWARE Escape from Moonbase Alpha, Starship Command etc (Phone for list) Snooker particularly wanted. (Disk owner preferred but not essential.) Tel Harpenden 69752

SWAP MY ATARI 400/800 SOFTWARE for Intellivision cartridges or WHY? Tel 01 654 7104 (Ansaphone)

16K SPECTRUM OWNER wishes to swap unwanted cassettes. Tel (0342) 26968 (after 6 pm)

BORED WITH YOUR SPECTRUM GAMES? Swap them with me. Vicki. Tel Potters Bar 59596

SWAP SPECTRUM GAMES and utilities. Tel Peter 01 559 3515 after 4.30 pm

ZX81s for sale

ZX81 GAMES ... ZX81 and Spectrum magazines from 50p. Tel Sheffield 619542

ZX81, 16K printer, £40 worth of books, magazine + joystick and interface. DK tronics keyboard. 4K graphics Rom. £100 software, learning lab, all boxed, still under guarantee. £85 ono. Tel 0580 72191

ZX81 16K + keyboard + £40 software + briefcase. £60. Tel 01 809 2841

ZX81 + 16K Ram + £30 worth software, excellent condition. £55. Tel Penketh (near Warrington) 2719 (after 5 pm)

ZX PRINTER 6 months old. £30 ono. Tel Oxford 36864

ZX81 1K good condition. £27 with magazines. Tel 01 881 2855

ZX81 + 16K + a Fuller keyboard + 20 games + 330 programs + manuals and magazines. £90. Tel 01 807 8864

FOR SALE ZX81 + 16K, magazines, cost £95, sell for £45. Tel Skelmersdale (Lancashire) 23203

Spectrums for sale

SPECTRUM 48K all manuals and leads, Kempston joystick and interface, Quickshot joystick, £200 worth of software, eight rolls ZX printer paper. £280 ono. Tel 01 399 5585

48K SPECTRUM printer, tape deck, paid £370 with software, yours for £200 ono. Tel Oxford 735864

16K SPECTRUM complete as new + nine games tapes and very good Basic and m/code programming books. £90 ono. Tel Fulmer (02816) 2508

£130 SPECTRUM plus £140 software, Kempston pro joystick, magazines, books and programming aids. Offers to Alistair, Bedford 212646 (after 4 pm)

SWAP SPECTRUM 48K + computer cassette recorder, £120 worth of quality software including compiler, for 16K Vic20 + cassette and software or Dragon 32 + software. Tel 0274 677183

Acorns for sale

ACORN ATOM with BBC Rom, software. £80 ono. Tel Elvington (near York) 080 485328

BBC MODEL B Basic 2, 1.2 operating system, Wordwise, tween disc drives, printer, modem, discs, programs etc. £1,300 ono. Tel 01 337 5278 (after 6 pm)

ACORN ATOM 12K complete with power supply, only £70 ono. Tel Leeds (0532) 742450

BBC MODEL B 1.2 operating system, Basic version 2, DFS + 100K disc drive + over £100 worth of quality software, only £650. Tel Maidstone 581827 (ask for Simon)

Ataris for sale

ATARI VCS + five cartridges. £75 no other offers. Tel after 4 pm 01-881 2589

ATARI 400 32K 410 recorder + joysticks. £180 ono. Tel Sunbury 82189

ATARI VCS paddles and joysticks with two cartridges, in good condition. £90. Tel 01-307 8864

ATARI VCS excellent condition + Combat, including joysticks. Bargain £55. Tel 648 0530

ATARI 400 48K joysticks and games, including Chicken, Rom, Raingoard, Sunday Golf and others. £130, excellent condition. Also two discs Bandits £11, Scott Adams Adventure (one graphic) £10. Tel Swanley 68281

Dragons for sale

DRAGON 32 with digital talking — £60 worth software + joystick. £150. Tel 556 5482 (after 6 pm)

DRAGON 32, leaving UK, must sell 15 cassettes software including Teleuter, Donkey King, Frogger, only 4 months old, all for £140, will deliver. Tel 01-897 9708 (evenings)

DRAGON 32 all leads, manuals + 2 joysticks + 1 cartridge + £80 worth cassette software. £160. Tel Belper 4753

NEW DRAGON guarantee + over £200 of latest software including assembler, joystick, £42 worth of books + light pen and all Dragon magazines, all worth £443, swap for BBC model A or B or sell £290. Tel 464 9225

DRAGON SOFTWARE, all popular titles including Telewriter, cost over £100, sell for £45, all original tape. Tel Ware 68264

DRAGON brand new software. £150. Tel 01 874 0550 (after 6 pm)

DRAGON 32 £66 of software, joystick, magazines, cassette recorder, as new, sell for £220 ono. Tel 051 845 7820

DRAGON 32 as new, over £100 of software, two joysticks, cassette recorder, books and magazines worth over £350, sell for £270. Tel 01 794 7078 anytime

DRAGON 32 + joysticks + software. £160. Tel Penkridge 3057

DRAGON 32 + joystick, tape recorder, dust cover, over 60 programs, Ghost Attack cartridge, games include Donkey King, Defender etc, books, magazines, boxed, under guarantee, as new. £200. Tel Uxbridge 38375

Tandys for sale

TRS 80 32K level 2 + green screen monitor + cassette recorder + books, manuals, magazines + games and utilities including toolkit + all leads. £250 ono (separate sales also). Tel 021 742 1446 (before 10 am or after 6 pm)

TRS 80 Model I level 2 16K, 50 game utility cassette + books, magazines + joystick, as new, boxed. £200 ono. Tel Tim on St Albans (0727) 65566 (office hours only)

Commodores for sale

COMMODORE 64 + C2N tape, tons of mags and Monopoly at £380 ono. Tel 01-864 5830

VIC20 SOFTWARE, Arcog, Crazy Gong, 16K version, never used; also CBM 64 software, Cyclon + Monopoly. Make me an offer. Tel 021 4405280 (ask for Ashwin) (private sale)

VIC20 + Commodore cassette recorder, still under guarantee + 16K Ram cartridge + joystick + excellent software + magazines. £140. Tel 0228 27700

COMMODORE PET 8K new Rom, integral cassette + monitor + Space Invader + manual + dust cover. £300. Tel Burnham 62387 (after 5 pm)

For sale

BBC SOFTWARE to sell or swap. Tel 574 2578

GENIE 1 still boxed, includes software, manuals and books. £200. Tel 051 5265817

WESTRAK CHESS COMPUTER 12 levels, excellent condition. £75. Tel 061 5265817

PROGRAMMERS ACE CARTRIDGE for a Vic20, unused. £28 ono. Tel Rushden (0933) 315248

BBC MODEL A + 32K excellent package worth over £600 including computer, monitor, cassette recorder and many extras, all as new, bargain for only £430. Tel Kidlington 6690 for details (evenings)

SOFTWARE FOR 16K ZX81 includes Galaxians, Pacman and 3D Monster Maze plus lots more, from £3 each. Tel Bournemouth (0202) 514977

ADVENTURE HELPLINE

Micro *BBC (B)*
Adventure *Sphinx Adventure*
Problem *How to get to the Sphinx after you have crossed the bridge*
Name *Lewis Jones*
Address *III The Mount, Dinas Powys, South Glamorgan*

Micro *ZX Spectrum*
Adventure *Inca Curse*
Problem *Cannot put out fire in the fire room which blocks stairs*
Name *D. Seager*
Address *26 Rissington Road, Tuffley, Gloucester GL4 0HR*

Micro *Vic20*
Adventure *Mission Impossible*
Problem *(1) How do I get the yellow key from the ledge? (2) How do I get into the other blue and yellow rooms?*
Name *Robin Green*
Address *Stoneleigh, Park Hill, Bewdley, Worcs DY12 2BE*

Micro *ZX81*
Adventure *Pimania*
Problem *Cannot use saxophone, pork pie or can of worms. In return I can help with Artic's Adventure B, C and D*
Name *Paul Waterman*
Address *119 Belvoir Close, Fareham, Hants PO16 0PR*

Micro *Dragon 32*
Adventure *Adventure 200*
Problem *Passing the troll on the iron bridge over the canyon, have tried giving fish, lamp, axe. Also identification of □□□□ symbols*
Name *Chris Garrington*
Address *57 Caswell Street, Llanelli, Dyfed, South Wales SA15 1RE*

Micro *Spectrum 48K*
Adventure *Artic Adventure D — Espionage Island*
Problem *Cannot get past the helicopter that shoots you when you sail downstream past the first stop — going in circles. (I have completed Adventures B and C.)*
Name *Andrew Pollard*
Address *Springfield, Dock Street, Wendens Ambo, Saffron Walden, Essex CB11 4JX*

NEW RELEASES

NASTY NIP



Luna Crabs is the unlikely title of a game Micromega hopes will become a classic

It seems that you have crash-landed on a planet which is populated only by vicious crabs that rush towards your beleagured outpost. Presumably capable of more than a nasty nip these crabs must be destroyed at all costs using your photon cannon

Although simple in idea the game does boast a number of fairly impressive features — you are attacked from all sides by the crabs and moving left and right gives you a 360 degrees view — the whole picture moves left or right

Program *Luna Crabs*
Price *£6.95*
Micro *Spectrum 16/48K*
Supplier *Micromega*
230-236 Lavender Hill
London SW11 1LE

RUSH HOUR

The Laser seems to be one of those "will it won't it" machines that could either do well or flop completely

Noted ZX software firm Abbex would seem to have bet firmly on the former. The first two releases for the machine should be available any time now — *Savage Toad* and *The Lost City*. *The Lost City* is an adventure game for the 16K machine but the *Toad* game treads more familiar ground

Savage Toad is of course *Frogger*. As ever rush hour traffic wizzes by and landing in the river means certain frog destruction (can't frogs swim?)

The game seems to have all the features of the original, including a lady frog (on whom you must jump for extra points) and various snakes and crocodiles

Program *Savage Toad*
Price *£4.95*
Micro *Laser 200*
Supplier *Abbex*
Tavistock House
34-36 Bromham Road
Bedford MK40 2QD

ENLARGED

Pendle Software has solved a problem that apparently plagues people trying to *Poke* to the Commodore screen ie graphics suddenly appearing inches into the screen because of the border

The program enlarges the screen on an 8 or 16K machine to roughly twice its original size. The program uses about half a K to achieve its effect and comes with a demonstration program to show the screen in action

Program *Vic20*
Price *£5.00*
Micro *Vic20 (8/16K)*
Supplier *Pendle Software*
3 Greenfield House
Greenfield Road
Colne
Lancs BB8 9PE

ERROR CHECK

Micro Doctor sounds like a great idea for an arcade game with little animated doctors rushing about. But *Micro Doctor* is a serious utility program

What the program does is to check for errors in computer operation within specified areas eg you can instruct it to check the attributes file, all the Ram etc. This means that provided your computer has not stopped working completely you will be able to find out where any error is situated

I have only one question supposing you return your (out of guarantee) computer to Sinclair with the helpful note that the problem is to be found in say the CPU will it cost you any less to get it repaired?

Program *Micro Doctor*
Price *£6.95*
Micro *Spectrum 16/48K*
Supplier *J H Gosden Software*
13 Ashtead Common
Ashtead
Surrey KT21 2ED

HONEY POT

Fozbee and the Hunny-Suckers is the name of an original standing arcade game from Amazing Games

You naturally enough are *Fozbee* who appears to be some sort of insect. *Fozbee* has to defend his honey from the ever lengthening tongues of the *Honey Suckers* (oh all right *Hunny Suckers*)

How do you stop a malevolent tongue? Why you jump on it of course — before it reaches your honey. Well it's an original concept whatever else

Program *Fozbee and the Hunny Suckers*
Price *£4.00*
Micro *Spectrum 48K*
Supplier *Amazing Games*
39 Maple Drive
Burgess Hill
West Sussex
RH15 8EX

FLOORED

Cable Software's *Drone Data-tank* is one of the more successful Dragon releases — fans of that program will be pleased to learn of two new offerings from the company — *Baccarat* and *Dragrunner*

Dragrunner puts you in charge of Super Sleuth Sidney. Sidney has to cross a factory floor negotiating six counter rotating conveyor belts which are gradually loaded with a growing number of radioactive components

If this weren't enough laser droids patrol the floors and the factory owners have just installed a drag zone intruder alarm system which electrifies the walls and floors. An added feature of the game is speech at suitable moments

Program *Dragrunner*
Price *£8.75*
Micro *Dragon 32 (+J Stick)*
Supplier *PSL Marketing*
Cape House
52 Limbury Road
Luton
Beds LU3 2PL

ALLIES

Since I reviewed it it's not betraying any secrets to say that DK'Tronics *Dictator* was and is one of the best Spectrum games I have played — so I can hardly greet its appearance on the BBC with the usual journalistic objectivity

Dictator is a very sophisticated and witty version of that old computer chesnut *Kingdom* where you perform a diplomatic balancing act to keep the factions of your state in harmony

Dictator takes this concept and virtually stands it on its head by placing you in charge of a particularly unstable banana republic somewhere vaguely equatorial. In *Dictator* you must play factions off against each other your only real allies being the secret police (who keep files on everybody) — mostly you will spend your time trying to keep factions weak ie ensuring that the peasants are undernourished etc

One thing I have noticed is that DK Tronics have not put up the price massively just because the BBC is a more "up-market" machine. Good for them

Program *Dictator*
Price *£6.95*
Micro *BBC 32K*
Supplier *DK'Tronics*
Unit 2
Shire Hill
Industrial Estate
Saffron Walden
Essex CB11 3AX

NEW RELEASES

WALKIES

I think Barbara Woodhouse would be very good at the latest game from Llamasoft since how you treat your dog is a key feature in it.

Hover Bovver puts you in charge of an air mower — your garden desperately needing a trim. Unfortunately your neighbour is not too happy that you have taken it and starts to run after you as you mow. If you mow any flowers by accident the gardener will also come after you.

But how, you might ask, does the dog fit into all this? Ah well, this is where the subtle BW training is important — as you mow, Rover (your dog) gradually gets more and more irritated by the sound and his dog tolerance level will gradually drop to zero — and he will come after you.

If Rover gets you, the mower will have to stop for a while and cool down. Rover can also be persuaded to chase the angry neighbour away but each time he does this his dog loyalty level drops — if it runs out, he will no longer respond to your commands.

The game reportedly has incredible graphics and a sound track arranged by a professional musician but, in any event, there are a large number of people who quite understandably will buy anything by Jeff Minter.

Program *Hover Bovver*
Price £7.50
Micro Commodore 64
Supplier Llamasoft, 49 Mount Pleasant, Tadley

GAMES PACK

What on earth can you say about yet another Spectrum games pack? The one virtue of such things is for the computer novice who wants a few games to get him started without having to spend £6 a time.

Several games for £5 sounds like good value, but you can be sure that if any one of the games were marketable on its own it would be — since the games aren't, you can be equally sure they aren't going to be much above magazine quality — if that.

So it's without any malice that I say of another Spectrum Games pack containing *Kamikaze Flight* and *Gopher* that you will probably get exactly what you have paid for — no more, no less.

Program *Kamikaze Flight*
Price £4.95
Micro Spectrum 16K
Supplier Block Byte Computing

ARMAGEDDON

Fashionsoft is a new software house who obviously means business — its new cassette *Armageddon* contains the best graphics I've seen outside of Ultimate games — on the Spectrum anyway.

Armageddon is like *Centipede* to begin with, as belligerent pods swarm down towards you. You are a smart looking fighter and aside from fighting off the pods, you must also shoot a nasty looking crab type object that is threatening the Earth and its moon.

Other stages have the pods augmented by a nasty insect creature that drops bombs on you.

Fashionsoft could be one of the more important names to emerge in the past couple of months in the Spectrum market.

Program *Armageddon*
Price £4.95
Micro Spectrum 16-48K
Supplier Fashionsoft, 13 Nympsfield Road, Gloucester

LORD OF THE GALAXY

If one trend in software is towards adventures, away from arcade games, the other may be in the direction of board games which use computers.

If this is correct, then Martech must be one of the front runners with two computer board games.

Galaxy Conflict consists of a board, various counters and a computer program for the ZX81 and the Spectrum. It requires two players who battle it out for galactic domination. This is achieved by the construction of vast interstellar spaceships called Eon cruisers.

A board (not a tv screen) depicts the galaxy and the various planets to be found within it. Players must accumulate *PJ* energy to develop their fleet and do battle.

The computer records the state of the two players who must keep track of their entire fleets at all times — forgetting about a ship parked on the edge of the Galaxy will end with the computer telling you that your crew have run out of supplies and are starving.

The game is intended to last for several hours and there are endless different tactics you can adopt to win the game.

Versions of the game are available for most of the popular micros and it all seems a lot more fun than *Space Invaders* or *Packman*.

For a fuller explanation of the game, and the company behind it, see Street Life on page 13 of this week's issue.

Program *Galaxy Conflict*
Price £11.95
Micro ZX81 16K Spectrum 48K
Supplier Martech Games, 9 Dillingburgh Road, Eastbourne, Sussex BN20 8LY

New Releases is designed to let people know what software is coming on to the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD

Ziggurat



What chance?

The chances of a random three-letter sequence being HAL is 1 in 17576 (ie 26^3 or 26 • 26 • 26)

Not very likely

What is the probability of the arrangement LHA or IBM or NJD? Exactly the same

Finding that HAL is IBM with the letters moved 'back' one place in the alphabet we suspect that this is why HAL is as it is. Tracy Kidder (in *The Soul of a New Machine*, Penguin Books) makes a great deal of the fact that computer engineers in the USA were very fond of such tricks, and he actually mentions HAL and IBM

With this arrangement of letters therefore mathematics and statistics can help us but a little. The real argument is with our common sense and our beliefs and expectations

The chance that the real sentence (ie 'The real ... expectations') occurred at random is 1 in 39^{73}. There are 73 spaces and punctuation marks in the sentence and any one of them could be one of 26 possible letters, 10 possible numerals or, we will assume, only two punctuation marks plus the space

Expert systems for, say, drilling an oil well depend upon arguments to do with probabilities. Suppose we have a drinking vessel. Is it a mug or a cup? Or is it neither — is it somewhere in between? What has been called 'fuzzy logic' has been invented to help out here

A drinking instrument, DI, is given a set of probabilities, the probability that it is a cup and the probability that it is a mug. Probabilities are calculated by looking at the DI and looking at the definitions of cup and mug. The probabilities are 'conditional' on what we know about the DI

As we find out more about the DI the conditional probabilities will change until (perhaps) at some point we might say 'This is almost certainly a mug'. An expert system for oil drilling performs much the same routines: it says that either it seems worth drilling at that point, or it does not.

Jorge Luis Borges (in his story *The Library of Babel*) takes this very argument further than any other writer I know. He invents a world of hexagonal rooms, each interconnected to other hexagonal rooms, and the walls filled with books in some indecipherable language

Slowly those who lived in this world discovered that '...the Library is a sphere whose exact centre is any one of its hexagons and whose circumference is inaccessible'. The Library was eternal

The letters and symbols in the books totalled 25: an alphabet of 22 letters, the comma, the full stop, and the space (no upper case letters were used)

The problem was to find a pattern — if such a thing existed — in the random sequences

A librarian found two pages of one of the books had two pages of homogenous text which — after a hundred years — they established as 'a Samoyedic Lithuanian dialect of Guarani, with classical Arabian inflections'. Then a Thinker made a guess that in the vast Library there were no two identical books

Furthermore, it was surmised that the Library was total and its shelves contained all possible combinations of the 25 symbols — a large number, but not infinite

Then others decided that on a shelf in some hexagon there must exist a book which is the formula and compendium of all the rest, a catalogue

If a book is possible, given the constraints of the alphabet and the size of the books (which were all equal) then that book must exist. 'Only the impossible is excluded. For example, no book can be a ladder, although no doubt there are books which discuss and negate and demonstrate this possibility'

Borges' great originality takes HAL and similar questions and reveals what can happen if we take the argument to extremes

The question in Borges' library was how to locate the master catalogue

The answer: 'If we call the catalogue book Book A, someone proposed a regressive method. To locate Book A, consult first a Book B which indicates Book A's position; to locate Book B, consult first a Book C, and so on to infinity' ■

Boris Allan

Puzzle

Difficult customer for corner cafe

Puzzle No 72

We have just been to Sunnysands-on-Sea for our holidays but due to generally indifferent weather a great deal of time was spent in the Cosy Corner Cafe

On one particular occasion a slight difficulty arose when a customer requested bacon, egg *and* chips. As you can see from the menu this was a possibility that hadn't been catered for and it presented the cashier with quite a problem

How much did each of the six items cost?

MENU

Chicken and Chips	£1 65
Sausage and Chips	£1 00
Sausage and Eggs	£1 10
Bacon and Eggs	£1 00
Bacon and Tomatoes	£0 95
Tomatoes and Chips	£0 75

Solutions to Puzzle No 67

The program works out each possible number. As it is permitted to use the value 9, the *For/Next* loops jump from 9 to 9 to allow this

```
10 LET T = 0 20 FOR A = 1 TO 9 30 IF A = 7 THEN
LET A = 9 40 FOR B = 1 TO 9 50 IF B = 7 THEN LET
B = 9 60 IF B = A THEN GOTO 170 70 FOR C = 1 TO
9 80 IF C = 7 THEN LET C = 9 90 IF C = B OR C = A
THEN GOTO 160 100 FOR D = 1 TO 9 110 IF D = 7
THEN LET D = 9 120 IF D = C OR D = B OR D = A
THEN GOTO 150 130 LET S = A * 1000 + B * 100 +
C * 10 + D 140 LET T = T + S 150 NEXT D 160
NEXT C 170 NEXT B 180 NEXT A 190 PRINT
"TOTAL = " T
```

The total is 3 999 600 so it turned out to be not such a good deal for Jamie. His friend only gave him three computer cassettes for working out the answer

Winner of Puzzle No 67

The winner is Revd Allan Burk, St Mark's Church, Kingstanding, Birmingham, who receives £10



Top 10

Atari
1 (2) Miner 2049er (Big Five)
2 (—) Diamonds (English)
3 (—) Curse of Crowley Manor (Adventure International)
4 (—) Witness (Infocom)†
5 (8) Zaxxon (Datasoft)
6 (—) Close Assault (Avalon Hill)‡
7 (10) The Blade of Blackpoole (Sirius)‡
8 (—) Orc Attack (Thorn EMI)
9 (—) Chop Lifter (Broderbund)
10 (—) Say a Demo (Penguin)
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

Vic20
1 (1) Arcadia (Imagine)
2 (6) Skyhawk (Quicksilva)
3 (—) Cosmic Cruncher (Commodore)*
4 (2) Wacky Waiters (Imagine)
5 (4) Catcha Snatcha (Imagine)
6 (17) Gridrunner (Llamasoft)
7 (—) Cosmiads (Bug-Byte)
8 (5) Protec (Bug-Byte)
9 (3) Sargon II Chess (Commodore)*
10 (—) Frantic (Imagine)
*Cartridge
(Figures compiled by Boots & Co, London)

ZX81
1 (1) Space Raiders (Psion)
2 (2) Espionage Island (Artic)
3 (4) Flight Simulation (Psion)
4 (18) Fantasy Games (Psion)
5 (5) 1K Games (Artic)†
6 (7) Defender (Quicksilva)
7 (6) Football Manager (Addictive Games)
8 (9) QS Scramble (Quicksilva)
9 (—) Chess (Sinclair)
10 (—) Ship of Doom (Artic)
All 16K except where shown. †Runs in 1K
(Figures compiled by Boots & Co, London)

Dragon
1 (1) The King (Microdeal)
2 (8) Frogger (Microdeal)
3 (3) Talking Android Attack (Microdeal)
4 (2) Space War (Microdeal)
5 (—) Shuttle (Microdeal)
6 (4) Night Flight (Salamander)
7 (6) Planet Invasion (Microdeal)
8 (—) Cuthbert Goes Walkabout (Microdeal)
9 (7) Champions (Peaksoft)
10 (10) Ring of Darkness (Wintersoft)
(Figures compiled by Boots & Co, London)



Spectrum
1 (2) Jet Pack (Ultimate)
2 (1) Flight Simulation (Psion)
3 (4) Horace and the Spiders (Psion/Melbourne House)
4 (—) Football Manager (Addictive Games)
5 (—) 3D Tank (DK Tronics)
6 (—) The Hobbit (Melbourne House)
7 (—) Horace Goes Skiing (Psion/Melbourne House)
8 (8) Transylvanian Tower (Richard Shepherd)
9 (—) Centipede (Psion)
10 (16) Ah Diddums (Imagine)
Requires 48K
(Figures compiled by WH Smith and Sons, London)

Books
1 (2) Complete Spectrum Rom Disassembly, Logan (Melbourne House)
2 (1) Structured Programming With BBC Basic, Atherton (Horwood)
3 (—) Commodore 64 Machine-code Master, Lawrence and England (Sunshine)
4 (5) Assembly Language Programming for the BBC Micro, Birnbaum (Macmillan)
5 (3) Commodore 64 Programmer's Reference Guide, Commodore (Commodore)
6 (4) Spectrum Hardware Manual, Dickens (Melbourne House)
7 (—) Z80 Assembly Language Programming, Leventhal (Osborne)
8 (16) Complete Forth, Winfield (Sigma)
9 (—) Delving Deeper into Your ZX Spectrum, Jones (Interface)
10 (—) The BBC Micro: An Expert Guide, James (Granada)
(Figures compiled by Watford Technical Books, Watford 0923 23324)
(Last week's position in brackets)

BBC*
1 (—) Felix in the Factory (Program Power)
2 (3) Danger UXB (Program Power)
3 (—) 3D Bomb Alley (Software Invasion)
4 (—) Gunsmoke (Software Invasion)
5 (—) Starship Command (Acornsoft)
6 (—) Inheritance (Simon W Hessel)
7 (6) Alien Swirl (Program Power)
8 (1) Escape From Moonbase Alpha (Program Power)
9 (5) Great Britain Ltd (Simon W Hessel)
10 (7) Snooker (Acornsoft)
*All Model B only
(Figures compiled by Micro Management, Ipswich 0473 59181)

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THE BIBLE	(ZX81 16) @ £[illegible]	
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THANKS FOR ALL THE NICE LETTERS FROM Mike Goldberg, Godzilla & the Crinkle Cuts, Dragon Dungeon, Eric Cook, E C , Doctor Robert, William Pearson, David Read, Reverend & Mrs Updyke, R J R Mallet, The Sunderland Pimaniacs, M Taylor, David Cross, Peter Tan, Brian Mellowship, Red Giant and Black Dwarf, Susan Cooper (wow! what a trouper!) & Elizabeth Newman, Lord Snooty and his pals Tom Robinson & the band, Stephen Burns, Portsmouth City Council, Bonzo, J Parker, Big Bertha & the kids, T Holgate, Robert Maxwell, A Hitler (!), Peter Adler, Suzi (that was some photo booth you used) and classmates

THE PIMAN IS BACK MANY THANKS FOR THE UNEXPECTED AND DEEPLY TOUCHING RESPONSE TO HIS ROTTEN - TEMPERED ULTIMATUM LAST WEEK, FROM ALL THE FOLLOWING NICE PEOPLE AND OTHER LIFE FORMS

SPECIAL THANKS TO

Paul Barnard for Dragon program,
Jaysoft for Commodore 64 program,
Derek Slowhand Reynolds for BBC,
Nick Gibbs for Oric program,
James Thomas for Dragon program,
M Norris for Dragon program,
Ken Fletcher & Carol for the bed,
BBC radio, for getting the dog's name right in the interview,
Chris Wigmore's Mum for cuddly toy,
Robin Evans for krummy kartoons,
young person who's name we can't find for pork pie and all the pots,
Veronica Leech, may your quill pen never go dry,
Karen Dean for the filthy postcard,
Mike Johnson for being a good host,
Unidentified-bugleblowing-blackman-in-miner's helmet-dressing gown-and laryngitis-at-the-Microfair,
whoever sent the unsigned kissogram,
whoever delivered it!

